Vol. 1074 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

January 27, 1987

U.S.
DEPARTMENT
OF COMMERCE

Patent
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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

January 27, 1987 Volume 1074 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1074 OG 420
Notice of Maintenance Fees Payable	1074 OG 420
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1074 OG 420
Reissue Applications Filed	1074 OG 421
Requests for Reexaminations Filed	1074 OG 421
Interference Practice: Fraud and Inequitable Conduct Allegations	1074 OG 421
Service by Publication	1074 OG 421
PTO Status	1074 OG 423
Patent Certificates of Correction	1074 OG 424
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1074 OG 425
Condition of Patent Applications	1074 OG 426
Reissue Patents Granted (32,335)	1809
Plant Patents Granted (5,864)	1813
Patents Granted	
General and Mechanical (4,638,509)	1815
Chemical (4,639,255)	2079
Electrical (4,639,542)	2165
Design Patents Granted (287,900)	2305
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 55
Classification of	
Patents (Including Reissues)	PI 61
Designs and Plants	PI 64
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 65
Designs and Plants	PI 66
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 24, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,426,739 through 4,428,078
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 9, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,073	06/654,190	1/28/86
(4,358,549)	06/288,289	(11/9/82)
4,357,726	06/257,200	11/9/82
4,357,740	06/264,359	11/9/82
4,357,752	06/216,157	11/9/82
4,357,753	06/291,397	11/9/82
4,357,776	06/230,410	11/9/82
4,357,778	06/295,109	11/9/82
4,357,789	06/244,604	11/9/82
4,357,804	06/236,550	11/9/82
4,357,807	06/223,569	11/9/82
4,357,850	06/226,694	11/9/82
4,357,873	06/231,802	11/9/82
4,357,885	06/292,094	11/9/82
4,357,898	06/242,893	11/9/82
4,357,905	06/301,558	11/9/82
4,357,909	06/234,383	11/9/82
4,357,952	06/316,892	11/9/82
4,357,966	06/259,479	11/9/82
4,357,976	06/252,865	11/9/82
4,357,978	06/245,595	11/9/82
4,357,982	06/299,861	11/9/82
4,357,993	06/216,337	11/9/82
4,358,036	06/248,265	11/9/82
4,358,066	06/239,171	11/9/82
4,358,078	06/234,022	11/9/82
4,358,085	06/285,677	11/9/82
4,358,091	06/279,060	11/9/82
4,358,096	06/242,511	11/9/82
4,358,106	06/225,675	11/9/82
4,358,112	06/299,272	11/9/82
4,358,113	06/233,921	11/9/82
4,358,120	06/262,502	11/9/82
4,358,142	06/236,219	11/9/82
4,358,144	06/223,934	11/9/82
4,358,185	06/294,008	11/9/82
4,358,190	06/302,762	11/9/82
4,358,194	06/287,918	11/9/82
4,358,205	06/243,550	11/9/82
4,358,212	06/277,094	11/9/82
4,358,218	06/339,569	11/9/82
4,358,219	06/346,791	11/9/82
4,358,258	06/291,285	11/9/82
4,358,268	06/216,242	11/9/82
4,358,271	06/233,409	11/9/82
4,358,276	06/285,300	11/9/82
4,358,316	06/220,596	11/9/82
4,358,323	06/340,775	11/9/82
4,358,332	06/235,930	11/9/82
4,358,348	06/352,347	11/9/82
4,358,352	06/275,725	11/9/82
4,358,378	06/249,587	11/9/82
4,358,396	06/226,456	11/9/82
4,358,424	06/317,554	11/9/82
4,358,430	06/311,164	11/9/82
4,358,437	06/253,360	11/9/82
4,358,438	06/253,238	11/9/82
4,358,483	06/331,048	11/9/82
4,358,495	06/251,084	11/9/82
4,358,498	06/262,928	11/9/82
4,358,504	06/271,043	11/9/82
4,358,515	06/301,126	11/9/82
4,358,544	06/279,539	11/9/82
4,358,590	06/238,480	11/9/82
4,358,595	06/311,078	11/9/82
4,358,596	06/226,899	11/9/82
4,358,606	06/275,099	11/9/82
4,358,613	06/243,732	11/9/82
4,358,651	06/233,927	11/9/82
4,358,668	06/253,354	11/9/82
4,358,754	06/267,408	11/9/82
4,358,755	06/241,895	11/9/82
4,358,758	06/244,294	11/9/82
4,358,760	06/256,853	11/9/82
4,358,795	06/242,050	11/9/82
4,358,834	06/254,809	11/9/82
4,358,841	06/252,569	11/9/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,428,272, Re. S.N. 825,015, Filed Jan. 31, 1986, Cl. 84/413, DRUM HOOP, Robert Andre, et al., Owner of Record: *The Selmer Co., Elkhart, Ind.,* Attorney or Agent: Thomas A. Briody, et al., Ex. Gp.: 211

4,506,439, Re. S.N. 750,113, Filed Dec. 3, 1985, Cl. 29/747, APPARATUS FOR SECURING AN ELECTRONIC UNIT TO AN AVIONICS TRAY, Joseph C. Roake, Owner of Record: *Barry Wright Corp., Newton Lower Falls, Mass.,* Attorney or Agent: Milton E. Gilbert, et al., Ex. Gp.: 326

4,518,972, Re. S.N. 919,951, Filed Oct. 17, 1986, Cl. 346/139R, GRAPHICS PLOTTER TURRET HEAD, Charles Gunderson, et al., Owner of Record: *Sanders Associates, Inc., Nashua, N.H.,* Attorney or Agent: Richard I. Seligman, et al., Ex. Gp.: 216

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Interference Practice: Fraud and Inequitable Conduct Allegations

In patent interference cases, the Board of Patent Appeals and Interferences will review every "fraud" and "inequitable conduct" issue which is properly raised at final hearing on the basis of the record as presented. Whatever basis may exist during the interlocutory stages of an interference for raising and pursuing such issues, Counsel is forewarned that when an interference approaches the final hearing stage, he or she should maturely reflect on the state of the record. Only if the record supports the fraud or inequitable conduct allegations by clear and convincing evidence should such issues be pursued at final hearing. Failure to heed this warning by pursuit of such issues at final hearing without a reasonable evidentiary basis to support each element thereof may result in the case being referred to the Office of Enrollment and Discipline for disciplinary investigation.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Dec. 23, 1986.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceed-

ings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Gynecic Laboratories, Inc., assignee, by mesne assignment, of Larre Laboratories, Inc., Yonkers, N.Y., Reg. No. 236,354, for the mark "ARC", Canc. No. 15,795.

Zenith Integrated-Data Processing, Inc., Sacramento, Calif., Reg. No. 890,658, for the mark "ZIP", Canc. No. 15,836.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Status of PTO Services

The following is an update of the status of PTO services for December 1986:

Service Item	FY 1987 Goal (Calendar Days*)	Monthly Average (Calendar Days*)
Filing Receipts:		
Patents	22	30
Trademarks	30	37**
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	15 Hours
Window Coupons	5	2
Mail Coupons	12	4
Letter Orders	16	18
Certified Copies:		
Trademark Registrations	21	36
Applications-As-Filed	17	14***
File-Wrapper/Contents	N/A	15
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	30
Filing Reg. Certificates	Issue Date	4 days Late
Assignments:		
Patents	20	18
Trademarks	20	18
Avg. Days from Issue Fee Payment to Issue Date	90–100	117****
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	95% on Issue Date
Trademark Copies Available	Issue Date	99% on Issue Date

* Unless otherwise noted.
** Delays in Mailroom processing.
*** The 5% of orders for which fiche are not on site are not included in calculations.
**** Interval from fee payment to issuance is increasing because of the budget cut which necessitated the printing of 4,000 fewer patents than originally planned in FY 86.

IMPROVEMENTS TO SERVICES

- *PTO Forms* — As a result of comments from a patent attorney, it was brought to our attention that the PTOL 85(b) and the PTOL 85c, "Issue Fee Transmittal", do not line up in the bottom right corner. This necessitates typing entries separately on each of the two forms. Also, it was pointed out that the back of the PTOL 85 is labeled PTOL 85(c) rather than PTOL 85(a). These errors occurred with the last revision and reprinting of the form. Corrections will be made with the next reprinting of this form.

  Also, as a result of a comment from a patent attorney, we learned that the Date Mailed heading on examiner action forms is sometimes illegible. This has been due primarily to misalignment of the printing of mail headings on the PTO forms. This is being corrected. Also, mail clerks have been instructed to check all copies of the forms carefully before mailing to ensure the information in the mail heading is legible.

HELPFUL HINTS

- *Official Searches* — The PTO has had an unusually large number of official search status letters returned by the Postal Service due to insufficient/incomplete addresses. When requesting an official search for a lost patent or trademark file, please ensure that all pertinent information is completely filled out on the PTO Form 1216. In the case of an individual working for a particular firm, the firm's name should be included in block number 5 of the form along with the name of the requester. If you have any questions in this matter, please call Luther Campbell on (703) 557–3560.

Jan. 5, 1987.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 27, 1987

D. 286,420	4,592,561	4,608,079	4,615,879
4,213,458	4,592,924	4,608,299	4,616,035
4,330,414	4,592,939	4,608,321	4,616,084
4,441,247	4,593,999	4,608,349	4,616,276
4,522,062	4,594,516	4,608,531	4,616,282
4,528,246	4,594,613	4,608,938	4,616,336
4,533,885	4,594,640	4,608,948	4,616,363
4,536,169	4,594,800	4,609,258	4,616,530
4,537,654	4,594,816	4,610,426	4,616,724
4,546,119	4,595,279	4,610,752	4,618,043
4,553,855	4,595,520	4,610,952	4,618,299
4,556,658	4,597,018	4,611,281	4,618,698
4,557,419	4,598,733	4,611,301	4,618,932
4,560,520	4,600,072	4,611,306	4,619,002
4,563,521	4,600,365	4,611,375	4,619,310
4,567,116	4,600,588	4,611,508	4,619,335
4,568,278	4,601,036	4,612,320	4,619,427
4,568,963	4,601,504	4,612,337	4,619,467
4,572,237	4,601,802	4,612,533	4,619,874
4,573,928	4,602,183	4,612,625	4,620,088
4,581,491	4,602,257	4,613,042	4,620,371
4,581,735	4,602,315	4,613,182	4,620,465
4,582,892	4,602,667	4,613,374	4,620,597
4,586,703	4,602,817	4,613,664	4,620,767
4,587,193	4,603,245	4,613,693	4,621,120
4,587,281	4,603,385	4,614,487	4,621,155
4,588,174	4,603,824	4,614,639	4,621,202
4,588,283	4,604,341	4,614,799	4,621,920
4,590,595	4,606,505	4,615,504	4,621,959
4,591,539	4,607,230	4,615,643	4,622,080
4,592,143	4,607,633	4,615,856	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 6, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-15-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	7-03-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-22-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	11-06-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-29-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	7-09-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during December 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,480,966 to 3,487,469, inclusive

Plant Patents . . . . . Numbers 2,945 to 2,958 inclusive

REISSUES

JANUARY 27, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

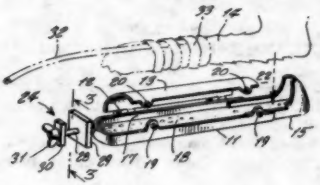
Re. 32,335
FLUID ADMINISTRATION SPLINT

Betty M. Heck, 3151 Glendale Hodgenville Rd., West Elizabethtown, Ky. 42701

Original No. 4,505,270, dated Mar. 19, 1985, Ser. No. 498,075, May 25, 1983. Application for reissue Jun. 10, 1985, Ser. No. 743,052

Int. Cl.[4] A61F *5/04, 13/00;* **A01K** *29/00*

U.S. Cl. 128—88 **8 Claims**



4. A fluid administration leg splint for animals comprising

a splint member for confining at least a portion of a leg of an animal therein,

a hard cover disposed over a substantial central portion of said splint member for preventing an animal whose leg is confined in said splint member from chewing or tearing away an intervenous needle and catheter taped to said leg,

a raised peripheral lip around said splint member forming a central depression for receiving an animal's leg having a catheter taped thereto, and

a latch for securing a forward end of said splint member to a cage containing said animal.

Re. 32,336
METHOD AND APPARATUS FOR CONDUCTING LOGGING OR PERFORATING OPERATIONS IN A BOREHOLE

Pierre C. Escaron, and Joachim A. Hoppe, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Original No. 4,349,072, dated Sep. 14, 1982, Ser. No. 194,016, Oct. 6, 1980. Application for reissue Jun. 15, 1984, Ser. No. 620,987

Int. Cl.[4] E21B *23/08, 43/11, 47/00*

U.S. Cl. 166—250 **45 Claims**

35. A method for logging earth formations surrounding a borehole by means of a well-logging tool, comprising:

providing a drill pipe with a tubular protection means at the end thereof, in such manner that the protection means forms an extension to said drill pipe,

attaching the well-logging tool to the end of the drill pipe so that said tool is positioned within said protection means,

lowering the protection means with the tool carried therein into the borehole, and

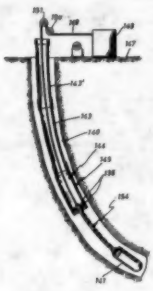
moving the tool through the borehole to log at least a portion of the formations surrounding the borehole.

45. An apparatus for logging earth formations surrounding a borehole, comprising:

a drill pipe

a tubular protection means coupled to the end of the drill pipe for releasably mounting therein, a well-*logging tool, said protection means forming an extension to said drill pipe, and having an inner diameter larger than that of the drill pipe, means for displacing the tool beyond the protection means into the borehole, and*

means for moving the tool through the borehole.



Re. 32,337
SYSTEM FOR CONVEYING CONICAL ARTICLES

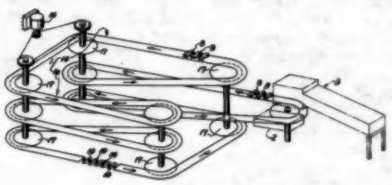
Yoshio Oizumi, Ibaragi, Japan, assignor to Yamakyu Automatics Co., Ltd., Osaka, Japan

Original No. 4,454,942, dated Jun. 19, 1984, Ser. No. 314,515, Oct. 23, 1981. Application for reissue May 3, 1985, Ser. No. 730,133

The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—463.6 **7 Claims**



4. A combination of a conveyor belt, a means for feeding conical articles to the conveyor belt, and a means for delivering the conical articles from the conveyor belt, wherein the conveyor belt comprises stands arranged equidistantly along the belt, each having a receiving portion for fitting said conical article therein with the tapered end of said article directed downward, a multiplicity of support bars arranged side by side and each having branches projecting from the opposite sides of said support bar, and a connecting rod attached to said branches on one side of each said support bar and engaged with said branches of an adjacent support bar; and said means for delivering comprises a pair of opposed endless chains arranged on the opposite sides of a path of transfer of said conical articles and spaced apart from each other by a larger distance in an upstream section and by a smaller distance in a downstream section, said chains being raised toward their downstream ends, and support pieces projecting from said chains and engageable with an upper end peripheral portion of said conical article to lift said article from said receiving portion with the rise of said endless chains.

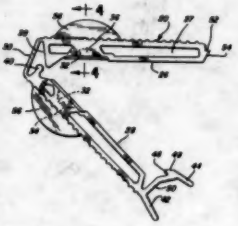
Re. 32,338
GRIPPER MEMBER FOR RETENTION OF A PLASTIC TUBE

John B. Alexander, Evanston; Michael T. Dennehey, Arlington Heights; Richard J. Greff, Ingleside, and John M. Munsch, Libertyville, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Original No. 4,227,730, dated Oct. 14, 1980, Ser. No. 43,061, May 29, 1979. Application for reissue Aug. 23, 1982, Ser. No. 410,749

Int. Cl.⁴ C25B *7/02*

U.S. Cl. 294—16 **17 Claims**



12. A gripper member which comprises: an openable and closable pair of handles interconnected by a hinge member, each handle defining, an arcuate recess positioned to face the corresponding recess of the other handle, and a wall member positioned longitudinally on each handle across each arcuate recess and at the same side thereof, whereby a flexible plastic tube may be surrounded and gripped in the arcuate recesses of said handles for rotational retention thereof as a connector member is inserted into or withdrawn from said tube, said wall members pinching said tube into closed, sealed relation when occupying said recesses with the handles in closed position.

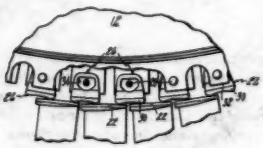
Re. 32,339
BLADE TO BLADE VIBRATION DAMPER

John C. Jones, Stuart; Perry P. Sifford, Jupiter, and Joel F. Sutton, North Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Original No. 4,347,040, dated Aug. 31, 1982, Ser. No. 193,514, Oct. 2, 1980. Application for reissue Jul. 31, 1984, Ser. No. 636,442

Int. Cl.⁴ F01D *5/10*

U.S. Cl. 416—190 **8 Claims**



1. In a rotor assembly of the axial flow rotary machine type in which a plurality of individually mounted blades, each having a platform section, extend outwardly on the machine, the improvement comprising:

a blade to blade damper adapted to seat against a pair of adjacent blade platform sections in response to centrifugally generated loads in an operating engine and of essentially "T" shaped cross section geometry including a top bar and a web extending circumferentially with respect to the machine between said pair of adjacent blade platform sections wherein the top bar provides longitudinal stiffness in the direction of expected slip load forces and the web provides transverse stiffness in the direction normal to the expected slip load forces.

3. The invention according to claims 1 or 2 in which said blade to blade dampers are of sufficiently light weight to limit the magnitude of the slipload force required to cause relative movement between said damper and said platform sections in an operative environment to a value below that which is generated by blade vibration such that energy in the vibrating blade is capable of being dissipated in the form of heat energy at the points of contact between the damper and platform sections.

4. The invention according to claim 3 wherein the weight of said dampers is approximately [four one hundredths of a pound (0.04 lb.).] *four one thousandths of a pound (0.004 lb.).*

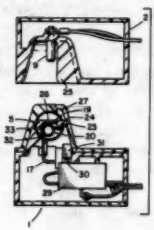
Re. 32,340
ELECTRICAL SWITCH-PLUG ASSEMBLY WITH BAFFLE

William C. Dobson, West Bend, Wis., and Carl R. Spoeth, New Port Richey, Fla., assignors to Dart Industries Inc., Northbrook, Ill.

Original No. 4,528,429, dated Jul. 9, 1985, Ser. No. 583,631, Mar. 2, 1984. Application for reissue Sep. 30, 1985, Ser. No. 772,110

Int. Cl.⁴ H01H *9/20;* **H01R** *33/30*

U.S. Cl. 200—50 B **23 Claims**



1. A plug and socket electrical connector, comprising:

(a) a plug having an electrically conductive plug prong,

(b) a socket engagable with said plug, having a passage comprising one or more apertures and an electrically conductive socket contact proximate said passage, said passage adapted to receive at least a portion of said plug prong in a position of engagement with said socket contact,

(c) means for establishing electrical union between said socket contact and a power supply,

(d) a movable baffle [rotatably] supported by said socket, *rotatable about an axis generally transverse to said passage,* having a shield movable to a closed position intermediate said passage and said socket contact and movable to an open position in which said socket contact is exposed to said passage,

(e) a baffle control arm rotatably supported by said socket and cooperative with said baffle, movable to a first position corresponding to said closed position of said shield, and having an engagement surface separate from said shield engagable to move said baffle control arm from said first position to a second position corresponding to said open position of said shield,

(f) means for moving said shield from said open position to said closed position when said baffle control arm is disengaged,

(g) means for moving said baffle control arm from said second position to said first position when said baffle control arm is disengaged, and

(h) a projection carried by said plug separate from said plug prong in a position of alignment with said engagement

surface when said plug prong is in alignment with said passage, *said projection* adapted to engage said engagement surface and to move said baffle control arm from said first position to said second position as said plug prong is moved from said position of alignment toward said position of engagement with said socket contact, whereby said shield is moved to said open position and said socket contact is exposed to said plug prong for engagement to establish an electrical connection between said socket and said plug.

5. The electrical connector of claim 4, wherein said [menas] *means* for establishing electrical union between said socket contact and a power supply comprises an electric switch between said socket contact and said power supply, means for biasing said switch open, and means for closing said switch when said plug is engaged with said socket.

Re. 32,341

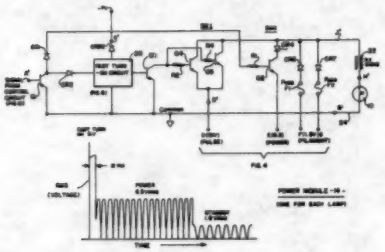
DISCO LIGHT ASSEMBLY

Robert M. Smith, 1443 Centinela Ave., Santa Monica, Calif. 90404

Original No. 4,389,598, dated Jun. 21, 1983, Ser. No. 233,173, Feb. 10, 1981. Application for reissue Mar. 12, 1984, Ser. No. 588,914

Int. Cl.[4] G05F *1/00*; H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—291 **18 Claims**



1. A *rapid turn-on* control system for selectively energizing a plurality of *filament-type* electric lamps including: power supply means; a plurality of control modules connected to said power supply means for respectively energizing respective ones of said lamps; and control circuitry connected to said control modules for causing the control modules selectively to activate the lamps, each of said control modules including: [first circuit means for supplying a continuous electric current to the corresponding lamp within an amplitude sufficient to maintain the filament of the lamp in a warm state but insufficient to illuminate the lamp, second circuit means including switching means responsive to control pulses from said control circuitry for selectively introducing a power current to the corresponding lamp of sufficient intensity to illuminate the lamp, and] circuit means including switching means responsive to [said] control *turn-on* pulses from said control circuitry for *selectively* introducing *high intensity* current pulses to the [corresponding] lamp [filament of a high amplitude as compared with the amplitude of said power current, each of said current pulses being introduced to the lamp filament] *filaments* for a [limited] *relatively brief* time interval; *and further circuit means including switching means responsive to said control turn-on pulses from said control circuitry for selectively introducing power currents to the corresponding lamp filaments of an intensity less than said high intensity current pulses but of sufficient intensity and of a relatively long duration to illuminate each lamp for a predetermined time interval.*

Re. 32,342

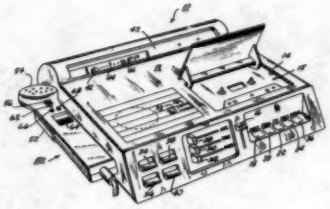
INSTRUCTION INDICATING APPARATUS FOR A RECORD AND/OR PLAYBACK DEVICE

Leslie N. Wilder; James C. Whitney, both of Fairfield, and Gary G. Matison, Wilton, all of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Original No. 4,051,540, dated Sep. 27, 1977, Ser. No. 678,697, Apr. 20, 1976. Continuation of Ser. No. 79,171, Sep. 26, 1974, abandoned. Application for reissue Jul. 26, 1984, Ser. No. 629,314

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—72.2 **19 Claims**



18. Indicator apparatus for use in a dictation/transcription device to provide a visual indication of the relative locations on a record medium used with said device at which predetermined signals are recorded, said apparatus comprising:

an array of selectively energizable visual indicating elements;

energizing means for selectively energizing said visual indicating elements;

scanning means for scanning said record medium for occurrences of said predetermined signals;

detecting means operable with said scanning means for detecting the recorded predetermined signals as said record medium is scanned and for producing an actuating signal in response to a detected predetermined signal; and

means operable in synchronism with said scanning means, said means causing said energizing means to be activated, in accordance with the actuating signals when the record medium has been scanned, so as to provide a visual indication of the relative locations of said predetermined signals.

PLANT PATENTS

GRANTED JANUARY 27, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,864

ROSE PLANT—MEIKRUZA VARIETY

Marie-Louise Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 11, 1984, Ser. No. 659,942
Claims priority, application France, Oct. 12, 1983, 4212
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—15 1 Claim

1. A new and distinct variety of Hybrid Tea rose plant characterized by the fact that:

(a) from a physical point of view, the plant has deep green adult wood, an upright growth habit, and forms attractive pale yellow blossoms of long duration which often are very lightly suffused with a light salmon pink coloration and comprise consistent petals; and

(b) from a biological point of view, the plant has vigorous vegetation, flowers abundantly, and exhibits good resistance to diseases;

substantially as herein shown and described.

5,865

PEACH TREE, SUMMER LADY

Hideo P. Yamashiro, Parlier, Calif., assignor to The Burchell Nursery, Inc., Modesto, Calif.

Filed Mar. 1, 1985, Ser. No. 707,489
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by similarity in tree and fruit to that of the O'Henry vareity of peach tree (U.S. Plant Pat. No. 2,964), from which it is a single scaffold mutation and from which it is distinguished and characterized as to novelty by bearing fruit which ripens approximately one week to ten days earlier than fruit of the O'Henry variety and which is distinguished from the fruit of the O'Henry in being more nearly globose and by displaying less green fruit ground color and a more uniform and brighter overall red skin coloration than that of the O'Henry at maturity.

5,866

NERIUM OLEANDER CV. MONVIS

Richard L. Purvis, Anaheim, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Jul. 8, 1985, Ser. No. 752,822
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—54 1 Claim

1. A new and distinct selection of *Nerium oleander* as substantially shown and described herein, that is characterized particularly as a novelty by the unique combination of large bright rose flowers, early flowering and a dense compact growth habit.

5,867

FELICIA AMELLOIDES HARTLEY WHITE

Richard R. Hartley, and Kathleen R. Hartley, both of 5737 Busch Dr., Malibu, Calif. 90265

Filed Sep. 21, 1984, Ser. No. 653,958
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of *Felicia amelloides* as described and shown herein characterized particularly by its vigorous growth pattern, and by its white ray flowers with yellow centers, as compared with the Blue Marguerite variety.

5,868

IMPATIENS PLANT NAMED ENTERPRISE

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 19, 1984, Ser. No. 663,677
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of New Guinea Impatiens plant named Enterprise, as described and illustrated, and particularly characterized by its intense pink flowers, large leaf size with distinct variegation, tolerance to moisture stress, and its vigorous self-branching bush growth habit, which makes it useful for pot and hanging basket use.

5,869

IMPATIENS PLANT NAMED TWILIGHT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 19, 1984, Ser. No. 663,708
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of New Guinea Impatiens plant named Twilight, as described and illustrated, and particularly characterized by its distinct red and light pink bicolor flowers, distinct variegated leaves, vigorous, highly self-branching dense bush growth habit making it useful for pot, hanging basket and bedding plant use; and by its adaptability to various environments of use.

PATENTS

GRANTED JAN. 27, 1987

ERRATA

For CLASS	See PATENT NO.
530-303	4,639,332
530-303	4,639,333
548-952	4,639,334
540-304	4,639,335
380-043	4,639,548
379-062	4,639,549
379-062	4,639,550
323-231	4,639,551
379-199	4,639,552
379-377	4,639,553
340-365	4,639,554
379-327	4,639,555
381-068	4,639,556
379-029	4,639,557

PATENTS

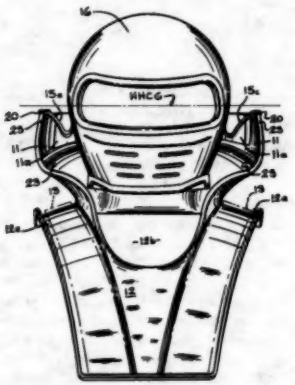
GRANTED JANUARY 27, 1987

GENERAL AND MECHANICAL

4,638,509
PROTECTIVE OUTER GARMENT FOR DIVERS
Rene Charron, 4115 - 67 Street N. W., Calgary, Canada (T3B 2J2)
Filed Sep. 23, 1985, Ser. No. 778,642
Int. Cl.[4] B63C *11/04;* A41D *13/00*
U.S. Cl. 2—2.1 R **2 Claims**

1. Protective trousers for use by divers in combination with a diving suit for preventing the expansion of air below the waist of the user comprising panel means defining leg, hip and waist encircling trousers, thread means permanently interconnecting said panel means along at least one edge thereof, whereby said panel means define trousers having openings along the entire length of at least one side thereof to permit the escape of air without disrupting the buoyancy of the user, loop means for engaging the feet of a user for retaining the trousers over substantially the entire length of the legs of a user; and coupling means for closing said open side of said trousers.

4,638,510
NECK PROTECTION DEVICE WITH OCCUPANT OF A HIGH PERFORMANCE VEHICLE
Robert P. Hubbard, 160 Kenberry, East Lansing, Mich. 48823
Filed Nov. 29, 1985, Ser. No. 802,986
Int. Cl.[4] A42B *3/02;* A62B *35/00;* B64D *25/06*
U.S. Cl. 2—6 **15 Claims**



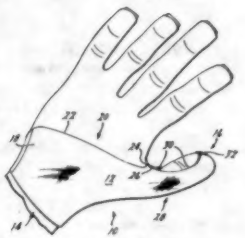
1. A neck protection device for a shoulder and lap belted driver or other occupant of a high performance vehicle having forward and lateral fields of view with a helmet on the head of the occupant and with horizontal level center of gravity of the head and helmet combined at about eye level of the occupant which comprises:

(a) a stiff restraining means including lateral, front and rear portions relative to the occupant which is contoured to fit the rib cage and shoulders and around the neck of the occupant;

(b) a stiff high collar mounted on the restraining means, having lateral, front and rear portions relative to the occupant, which extends upward to adjacent the center of gravity of the head and helmet combined and adjacent the neck of the occupant around the lateral and rear portions of the restraining means and which is open at the front portion of the restraining means and allows movement of the helmeted head to provide the forward and lateral fields of view; and

(c) first fastening means mounted around the collar adjacent the center of gravity of the helmeted head for attaching a plurality of tethers between the lateral and rear portions of the collar and the helmet, wherein the tethers provide a restraint which is in a substantially horizontal plane between the helmet and the collar and wherein in normal vehicle operation or in a crash the collar transmits forces to the restraining means from the tethers thereby reducing the forces being transmitted through the neck which cause fatigue and injury in vehicle operation or in a crash.

4,638,511
BOWLING GLOVE
Peggy J. Haack, 4913 Elmhurst, Royal Oak, Mich. 48073
Filed Nov. 18, 1985, Ser. No. 799,145
Int. Cl.[4] A41D *19/00;* A63D *5/00*
U.S. Cl. 2—161 A **8 Claims**

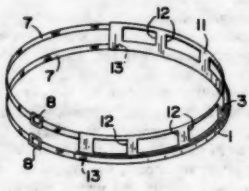


1. A bowling glove comprising a wrist band and a thumb stall conected to said wrist band, said thumb stall having an open portion wherein when said glove is applied to a wearer's hand the top of the wearer's thumb is covered and said open portion corresponds to and exposes substantially the entire inner face of said wearer's thumb.

4,638,512
SWEAT COLLECTING HEADBAND
Alfred R. Frankel, 403 Gulf Way - Apt. 701, St. Petersburg, Fla. 33706
Filed Apr. 11, 1985, Ser. No. 721,887
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—171 **5 Claims**

1. A headband assembly comprising a headband of flexible non-absorbent material adapted to be fitted directly and snugly against the forehead of the wearer, said headband having at least one trough permanently fixed therein extending along a substantial portion of the length of said headband, said trough being disposed in said headband so as to intercept and collect sweat running down the head of the wearer and having drain-

ing means located so as to be positioned at the side of the wearer's head to allow the running off of collected sweat from said trough, the side of said trough adapted to being fitted tightly against the wearer's forehead comprising a strip having



a width of 0.25–2.5 inches and having open portions therein comprising a total of 25–95% open area, said assembly also comprising a means for holding said headband tightly against the wearer's forehead.

4,638,513

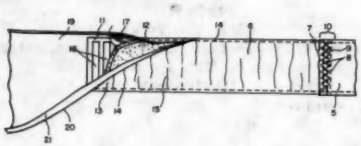
LATERALLY STABILIZED BRA STRAP

Alma J. Woods, 2400 Oneida, Denver, Colo. 80207

Filed Nov. 25, 1985, Ser. No. 801,292

Int. Cl.[4] A41D *27/26*

U.S. Cl. 2—268 **19 Claims**



1. In a strap for use with garments and packs and adapted for use adjacent the skin, the improvement comprising:

elastic ribbon means adapted to stretch in at least the longitudinal direction and substantially resistant to bending laterally;

padding means enclosing the elastic ribbon means;

smooth-faced material means enclosing the padding means and having a longitudinal excess of smooth-faced material means sufficient to create undulations in the surface of said smooth-faced material means when the elastic ribbon means is unstretched and a smooth surface in said smooth-faced material means when the elastic ribbon means is partially stretched; and

stitching means attaching the elastic ribbon means, padding means and smooth-faced material means along each of the longitudinal edges of the strap.

4,638,514

RAISED SUPERIMPOSED TOILET SEAT AND BIDET-LIKE DEVICE IN COMBINATION

Kurt Landsberger, 103 Harrison St., Verona, N.J. 07044

Filed Mar. 24, 1986, Ser. No. 842,938

Int. Cl.[4] A47K *13/00*; A61H *35/00*; E03D *9/08*

U.S. Cl. 4—239 **10 Claims**

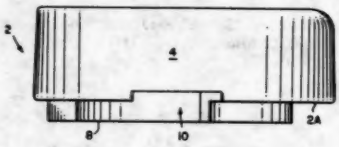
1. For use with a toilet of the type having a bowl, a raised superimposed toilet seat and bidet-like device in combination, characterized by:

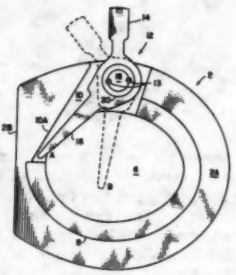
the raised seat including an upper portion which rests on the bowl, a lower portion which fits into the bowl, a hole extending through the upper and lower portions, an underside and a back;

a channel disposed on the underside of the raised seat and extending through a side of said seat;

the bidet-like device supported in the channel for displacement in a plane parallel to the plane of the seat;

the bidet-like device having a member extending external the channel through the side of the seat and operable for displacing said device; and





the channel arranged to provide clearance for the device when said member is operated for displacing the device from a non-use position near the back of the seat to a use position near the center of the hole.

4,638,515

TOILET HOOK

Anthony Caputo, and Gary P. Culter, both of 2273 Dundas Street West, Mississauga, Ontario, Canada (L5K 1R6)

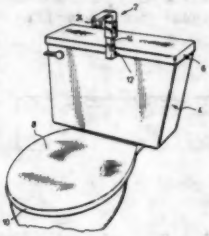
Filed Dec. 24, 1985, Ser. No. 813,228

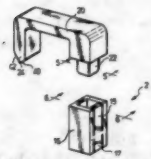
Int. Cl.[4] A47K *13/00, 17/00*

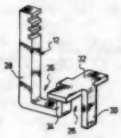
U.S. Cl. 4—661 **8 Claims**

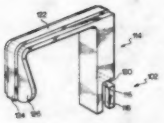
1. Apparatus for releasably maintaining a toilet seat in a generally vertical position comprising mounting means for securing said apparatus to a toilet and means for selectively contacting and maintaining such toilet seat in the vertical position and wherein said mounting means includes a channel means for engaging either side and the top edge of a toilet tank wall with an upright portion to one side of said channel means for adjustably receiving and engaging said selective means, said selective means including a collar portion one end of which is adapted for adjustable connection with said upright portion and the other end adapted to allow horizontal rotation of said selective means about said upright portion, said selective means including a forwardly extending arm at the end opposite said collar portion having a cam surface for contacting a toilet seat which moves there past by resiliently bending

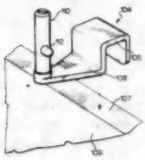
said arm, said arm returning to a position to cause said cam surface to engage such seat and maintain the same between said

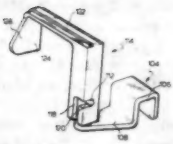












cam surface and said collar unless acted upon by a non gravitational force urging such seat towards a horizontal position.

4,638,516

THERAPEUTIC BED SUPPORT

John H. Vrzalik, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Continuation of Ser. No. 567,224, Dec. 30, 1983, abandoned, which is a division of Ser. No. 226,118, Jan. 19, 1981, Pat. No. 4,432,353. This application Jan. 22, 1986, Ser. No. 821,207

Int. Cl.[4] A61G *7/00*

U.S. Cl. 5—64 **5 Claims**

1. An undercarriage for a bed comprising:

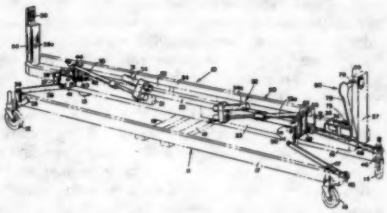
a base comprising a plurality of longitudinally extending, substantially parallel beams and a transverse beam rigidly mounted to said longitudinally extending beams, said transverse beam holding said longitudinally extending beams in transversely spaced relationship;

a bed support comprising

a first longitudinally extending beam,

a second longitudinally extending beam substantially parallel to said first longitudinally extending beam and spaced longitudinally therefrom, and

a third longitudinally extending beam substantially parallel to and connected to said first and second longitudinally extending beams, said third longitudinally extending beam being connected to said first and second longitudinally extending beams on the side away from said base;



means for lowering said first, second and third longitudinally extending beams into a position in which said first and second longitudinally extending beams enter the space between the longitudinally extending beans of said base, the lowering of said first, second and third longitudinally extending beams being limited by engagement of the transverse beam of said base by said third set of longitudinally extending beams; and

a patient support platform mounted to said first and second longitudinally extending beams.

4,638,517

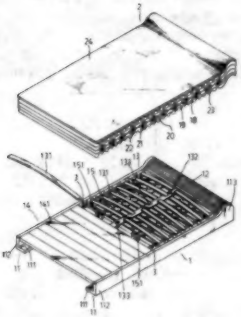
STRUCTURE FOR BED

Yan Y. Yang, and Chu H. Tsair, both of Taipei, Taiwan, assignors to Ming Cherng Tsai, Taipei, Taiwan

Filed Jun. 6, 1985, Ser. No. 741,797

Int. Cl.[4] A47C *23/06, 27/16*

U.S. Cl. 5—236 R **2 Claims**



1. An improved structure for bed comprising:

a rectangular main frame provided at its opposite long sides with a pair of parallel supporting members each of which is formed with a first wall and a second wall perpendicular thereto, each said second wall being furnished with an arcuate end, a pillow portion being disposed on the arcu-

ate ends of the supporting members to receive a human's head, an end portion being located on the opposite ends of the supporting members to receive the human's legs and feet, an arcuate portion being placed on the middle of the supporting members and located between the pillow portion and the end portion thereof to receive a human's shoulders, back and hips, the arcuate portion comprising a plurality of bamboo pieces which are bent downwardly to form a predetermined curve;

a plurality of fixing seats each of which consists of a pair of closed upper and lower hollow bodies wherein the upper body is formed with a pair of opposite flat sides and another pair of opposite arcuate sides symmetrically extending upwardly while, the lower body is formed with a pair of opposite flat sides and another pair of opposite arcuate sides symmetrically extending downwardly, the upper body being provided at its interior with a pair of pins which are parallel to each other and to the flat side thereof and form a slit therebetween, the closed upper end of the upper body being formed with a slot which can be associated with the slit therein to serve as a fixing means, said fixing seats being respectively disposed on the first walls of the supporting members in such a manner that each fixing seat located on one of the supporting members is aligned with its corresponding fixing seat located on the other supporting member thereof, a plurality of supporting pieces each of which is connected between the upper bodies of each pair of aligned fixing seats, a pair of short supporting columns respectively disposed on the upperside of each supporting piece and each supporting column being provided at its upper end with a shaved portion, each bamboo piece of the arcuate portion corresponding to each pair of aligned fixing seats being so arranged that its both ends are respectively inserted through the slots and then into the slits of the fixing seats and finally clamped between the pins therein, when the bamboo pieces fixed in the corresponding fixing seats, the angle between each bamboo piece and its corresponding supporting piece being preferably 15° and the underside of each bamboo piece being contacting slightly with the shaved portions of the supporting columns, a fixing strip furnished with a plurality of slits through which a plurality of corresponding bamboo pieces may pass to fix said bamboo pieces fixedly connected together;

a mattress body comprising a pair of sponge pads which are overlapped with each other and form a plurality of recesses therebetween, a sheet of cotton disposed between the sponge pads, to absorb the moisture therein, a pair of EVA pads, which are wave-like on one surface, respectively disposed on the upperside and the underside of the sponge pads; wherein the EVA pads are formed into wave type for obtaining a better ventilation effect,

a top pad disposed on the upperside of the mattress body, wherein the interior of the top pad is filled with tea and mint to provide a comfortable feeling for a human's body.

4,638,518

WATER BED MATTRESS

Winfried P. Barbulla, Bregneveien 22, N-1825 Tomter, Norway

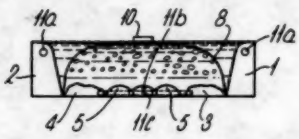
Filed Dec. 4, 1985, Ser. No. 805,422

Claims priority, application Norway, Dec. 17, 1984, 845056

Int. Cl.[4] A47C *27/10*

U.S. Cl. 5—452 **7 Claims**

1. A water bed mattress made from a waterproof, flexible material having tensile strength, provided with at least three chambers with valves, one chamber of which contains water, and a particulate material floatable on water and the other chambers containing air, characterized in that said chamber containing water and buoyancy particles is bordered on its bottom portion and laterally at least at each longitudinal side by said air chambers and that the water-/buoyancy particle chamber is provided with a flexible partition wall, formed as an intermediate bottom that is secured to the bottom member of said mattress and is arcuate upwards in breadth as well as the longitudinal direction in a non-loaded state, resulting in an upper and a lower chamber portion, said lower chamber being filled with water and buoyancy particles immersed in the water and said upper chamber portion being filled with water, said



intermediate bottom adapted to retain said buoyancy particles in said lower chamber and, the longitudinal arch of the intermediate bottom being more steeply arched at the head of said water bed mattress than at its foot end in a non-loaded state.

4,638,519

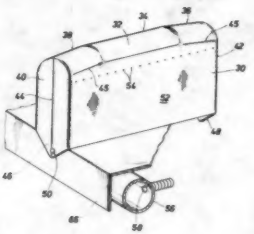
FLUIDIZED HOSPITAL BED

Jack H. Hess, Houston, Tex., assignor to Air Plus, Inc., Houston, Tex.

Filed Apr. 4, 1985, Ser. No. 719,874

Int. Cl.[4] A47C *27/10, 27/08*

U.S. Cl. 5—455 **14 Claims**



1. A fluidized hospital bed system comprising:

(a) patient support means being adjustably positionable for the comfort of a patient and defining adjustable bed segments;

(b) a plurality of generally identical patient supporting air bags being positioned in side-by-side relation on said patient support means and defining elongated crevices therebetween, said air bags being formed of air and water impervious, water vapor permeable material, said air bags each defining a bottom surface, an upper surface, side surfaces and end surfaces, each of said air bags having a single air inlet opening in said bottom surface and defining elongate air distribution bands located in said crevices, said elongate air distribution bands being located generally along an upper portion of at least one of said side surfaces and being defined by a plurality of small air vent openings disposed along the upper portion of at least one of said side surfaces of said air bags, said small air vent openings being located in spaced relation to establish a condition of continuous evenly distributed air circulation from said air bags along the length of said crevices and immediately beneath the patient; and

(c) air supply means being in communication with said air supply opening means of said air bags and being operative to maintain said air bags suitably inflated for patient support and comfort and to compensate for air flow from said small air vent openings into said crevices.

4,638,520

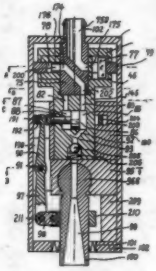
TOOTHBRUSH CAPABLE OF MULTIDIRECTIONAL BRUSHING

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 421,637, Sep. 22, 1982, abandoned, which is a division of Ser. No. 180,747, Aug. 25, 1980, abandoned. This application Jan. 23, 1984, Ser. No. 573,255

Int. Cl.[4] A46B *13/06*

U.S. Cl. 15—22 R 3 Claims



1. A device which has chambers which are able to contain fluid, wherein inlet means and outlet means are provided to lead fluid to and away from said chambers, said chambers are provided to a rotor which is revolvably borne in said device and surrounded by a stroke guide for guiding the increase and decrease of said volume of said chambers in combination with means to periodically at each single revolution of said rotor to increase and decrease the volumes of said chambers, individually for each of said chambers when fluid flows through said chambers, said device contains also a medial portion, a shaft with said shaft pivotally borne in the housing of said device, a control body to control the flow of said fluid to said chambers, a transfer arrangement and an improvement with said improvement comprising, a combination,

wherein said transfer arrangement includes a transfer lever which is swingably borne substantially by its medial portion on a bearing in the housing of said device while said lever has two ends with one of its ends subjectable to thrust by a piston rod and the other of its ends connected to said shaft,

wherein said medial portion is provided with a rotary member,

wherein a radially extending space is provided in said rotary member with a reciprocable piston provided in said space with a piston rod extending from said piston through a portion of said space and through a portion of said rotary member outwards of said rotary member to be able to engage a ring provided between said piston rod and said one end of said lever, and,

wherein said rotary member is provided with ports and passages to transfer fluid from one of its ports to one end of said space and from the other of its ports to the other end of said space when said ports revolve over respective control ports which are provided on said control body, by which said fluid in said ends of said space provides thrusts onto the ends of said piston to press said piston towards one end of said ends of said space and thereby to press said piston rod against said ring, said ring against said one end of said lever to swing said lever whereby the other end of said lever pivots said shaft in said housing of said device.

4,638,521

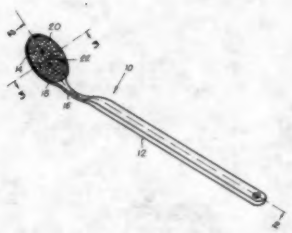
ORAL CLEANING DEVICE

John E. Potente, and Daniel F. Potente, both of 4 Nichols Ct., Muttontown, N.Y. 11545

Filed Aug. 14, 1985, Ser. No. 765,459

Int. Cl.[4] A46B *9/04*

U.S. Cl. 15—111 16 Claims



1. An oral cleaning device comprising a generally spoon-shaped body having a handle coxtensive with a bowl-like head that forms the insertion end of said device at one end, at least one cleaning element located in said bowl and extending from the surface thereof and extending upward from and about the curved interior of the bowl substantially to the rim of said bowl, and said cleaning element being curved to fit the curved contour of the tongue and mouth and conforming with the surfaces of the tongue and mouth with which it comes into contact to permit said cleaning elements to clean the same.

4,638,522

CURLING BROOMS

Charles M. Robertson, 36 Simonston Blvd., Thornhill, Ontario, Canada (L3T 4L2)

Filed Mar. 11, 1985, Ser. No. 710,387

Int. Cl.[4] A46B *17/00*; A25B *1/04*

U.S. Cl. 15—160 2 Claims

1. A curling push-broom comprising:

(a) a longitudinally elongated broom handle having a proximal end and a distal end and a longitudinal extent of uniform diameter extending between said ends which is equal to the length of a conventional curling broom handle,

(b) a brush head mounted at the distal end of said handle,

(c) a sleeve having a slipway opening inwardly from one end thereof, said slipway having a length which is not more than about 60% of the length of said broom handle such that a substantial portion of the handle will project from the sleeve when the broom handle is fully telescoped within the sleeve, said slipway having a substantially uniform diameter along its full length to receive said proximal end of said broom handle in a free-fitting sliding relationship so as to permit reciprocating movement of the handle within said sleeve during sweeping, said proximal end of said broom handle being slidably mounted in said

slipway, said sleeve being located on said broom handle so as to be interposed between the broom handle and the point of contact of the broom handle with the clothing of a curler such that during sweeping, the broom handle will move relative to the sleeve while the sleeve remains substantially stationary with respect to the clothing of the curler, thereby to substantially prevent wear damage to the clothing of the curler.

4,638,523
AIR GUARD DIFFUSER
Mike J. Todd, Eagan, Minn., assignor to Multi-Clean, Inc., St. Paul, Minn.
Filed Apr. 5, 1985, Ser. No. 720,258
Int. Cl.[4] A47L *11/14, 11/40*
U.S. Cl. 15—98 **7 Claims**

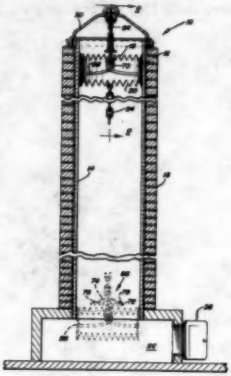
1. In combination, a rotary floor polishing machine having a polishing element rotatable at high rotary speed for engaging and polishing the floor; a shroud partially enclosing said element and having a lower peripheral edge normally spaced above the surface of the floor to define an annular air space about said polishing element; and an air guard diffuser comprising an air permeable element of flexible material extending about said shroud and from the peripheral edge of said shroud to the floor to encompass substantially all of said air space beneath the peripheral edge of said shroud with air permeable material to intercept particles forced outwardly by said polishing element while permitting air resulting from the rotation of said element to pass, said material characterized as free from scratching or marring the floor, and mounting means for removably mounting said air permeable element to said shroud including a circular mounting ring having a plurality of spaced apertures and adapted to couple with said shroud and extend beneath the peripheral edge thereof to receive the upper portion of said air permeable element, and a circular retaining clip encompassing the air permeable element for mounting the same to said mounting ring, said circular mounting ring defining a plurality of radial orifices spaced thereabout and permitting the free passage of air flowing from said polishing element to pass through said air permeable element and said mounting means.

4,638,524
CREOSOTE CUTTER MOUNTING BRACKET ASSEMBLY
Leland D. Marcellus, P.O. Box 657, Unadilla, N.Y. 13849
Filed Jan. 24, 1984, Ser. No. 573,321
Int. Cl.[4] F23J *3/00*
U.S. Cl. 15—249 **18 Claims**

1. A new and improved chimney cleaner mounting bracket assembly comprising:

a bracket bar positionable across a topmost portion of said chimney;

pulley means substantially centrally positioned on said bracket bar, said pulley means comprising a length of cylindrical conduit, said bracket bar being unattachably directed through an interior portion of said conduit, said conduit having an interior diameter substantially greater than a dimensional diameter of said bracket bar, said conduit hanging freely upon a horizontal portion of said bracket bar, said pulley means being operable to receive a supporting chain for said chimney cleaner and having the same directed thereover, said pulley means being erratically radially movable in multiple directions relative to said bracket bar, thereby to compensate for irregular axial movement of said supporting chain during a movement of said chimney cleaner within said chimney;



a support plate fixedly attached to said bracket bar and being positionable on a topmost surface of said chimney; and

a banding guide forming a part of said bracket bar and being designed to receive a banding iron for fixedly securing said chimney cleaner mounting bracket assembly to said chimney.

4,638,525
WIPER BLADE RUBBER
Hiroshi Sugita; Tadanobu Iwasa; Takemasa Yasukawa, and Masanori Aritake, all of Aichi, Japan, assignors to Toyoda Goseki Co., Ltd., Nishikasugai, Japan
Filed Jul. 23, 1985, Ser. No. 758,091
Claims priority, application Japan, Jul. 30, 1984, 59-160953
Int. Cl.[4] B60S *1/38*
U.S. Cl. 15—250.36 **11 Claims**

1. A wiper blade rubber, comprising:

a longitudinally elongated matrix integrally joined along the length thereof at a forward end thereof, with a lip, both said matrix and said lip having two laterally opposite sides, and said lip having a forward end adapted to be slid in wiping contact with a windshield surface;

said matrix, at least throughout a major portion thereof exclusive of two laterally-opposed contact portions which are provided for contacting metal wiper fixtures for mounting the wiper blade rubber for windshield wiper use, being made of a rubber mixture which is peroxide-vulcanized preponderantly EPDM rubber;

said lip, at least on said two laterally opposite sides thereof being made of a preponderantly non-EPDM, surface-

chlorinated diene rubber selected from the group consisting of styrene-butadiene, natural rubber, isoprene, butadiene and chloroprene.

4,638,526

NOZZLE ASSEMBLY FOR VACUUM CLEANER

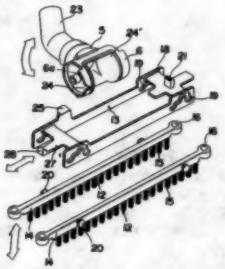
Yoshitaka Murata, Shiga; Tsuyoshi Hatano, and Hideo Ohkubo, both of Yokaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 18, 1985, Ser. No. 713,031

Claims priority, application Japan, Mar. 19, 1984, 59-52507; Mar. 19, 1984, 59-52548

Int. Cl.[4] A47L 9/06

U.S. Cl. 15—367 **11 Claims**



1. A suction nozzle assembly for a vacuum cleaner, which comprises: a suction spout having a coupling stem for fluid-connection with the vacuum cleaner, a generally rectangular nozzle housing tiltably connected with the suction spout and having a sweeping surface defined at the bottom thereof, said sweeping surface being adapted to confront a surface to be cleaned, an elongated brush assembly carried by the nozzle housing for movement between projected and retracted positions in a direction perpendicular to the longitudinal direction of the housing through the sweeping surface, a brush height adjustment means for adjustably moving the brush assembly to either the projected or the retracted position, and a restraining means for restraining the housing from undergoing an arbitrary tilting motion relative to the suction spout, said restraining means being operatively associated with said brush height adjustment means.

4,638,527

VACUUM CLEANER ATTACHMENTS

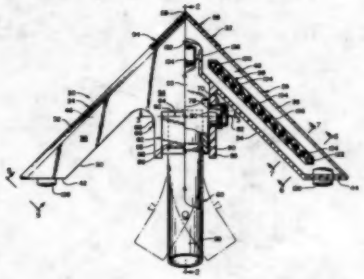
Eugene T. Fleischhauer, 1413 Wesanne La., Midlothian, Va. 23113

Division of Ser. No. 832,173, Feb. 20, 1986. This application Jul. 17, 1986, Ser. No. 886,399

Int. Cl.[4] A47L 9/06

U.S. Cl. 15—371 **14 Claims**

1. A vacuum cleaner attachment which is particularly adapted to reach into corners and crevices and to reach along walls, said attachment comprising: a V-shaped housing having a pair of legs which meet and form a sharp nose at the forward end of the attachment, said legs each having inner, outer, top, and rear walls which cooperate to form an elongated, open bottom vacuum chamber with an inverted U cross-section; a tubular vacuum fitting in communication at its forward end with the vacuum chambers in the first and second legs at the nose of said V-shaped housing; a support for said vacuum fitting which defines a vacuum plenum which provides fluid communication between said vacuum fitting and the vacuum chambers in the legs of said housing; a cleaning brush extending longitudinally along and housed in each of said vacuum chambers, said brushes having bristles which are adapted to come into contact with and dislodge foreign substances from a surface being cleaned; means at the opposite ends of said brushes for mounting the brushes in the vacuum chambers formed in the legs of said housing for vertical movement



therein; and means at said opposite ends of said brushes for biasing said ends of brushes toward the open lower sides of said legs of said housing.

4,638,528

OIL TYPE DAMPER

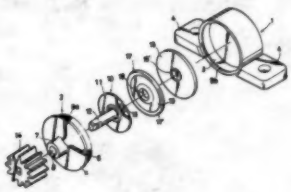
Nobuaki Omata, Yokohama, Japan, assignor to Nifco Inc., Awa, Japan

Filed Apr. 25, 1983, Ser. No. 488,470

Claims priority, application Japan, Jun. 12, 1982, 57-86756[U]

Int. Cl.[4] E05F 5/02

U.S. Cl. 16—82 **7 Claims**



1. An oil type damper, including:

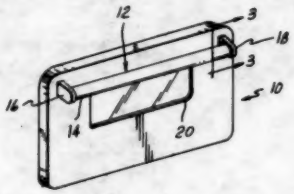
a housing having a cylindrical chamber open at one end, a centrally apertured cap for closing said chamber, a flexible membrane positioned intermediate the ends of said chamber for dividing said cylindrical chamber into two compartments and including a centrally located aperture having a flexible annular lip, a shaft liquid-tightly extending through said annular lip and having one end of said shaft projecting out of said housing through said centrally aperture cap, said shaft having means for transmitting rotational force fixed to said one end thereof, a braking disc contained within one of said compartments which is filled with oil, said disc fixed to rotate in concert with said shaft on one side of said membrane and a rotating member fixed to said shaft on the opposite side of said membrane and contained within the other of said two compartments, said member adapted to rotate in concert with said braking disc, said rotating member and said braking disc being in confining contact with adjacent edges of the annular lip therebetween and caused to pinch said annular lip of said flexible membrane against said shaft said flexible membrane being fixed relative to said housing while said shaft rotates relative to said membrane.

4,638,529

HANDLE CONSTRUCTION

Joseph W. Katona, Walled Lake, Mich., assignor to Mills Products, Inc., Farmington, Mich.

Filed Jul. 5, 1985, Ser. No. 751,878
Int. Cl.[4] E05B 1/00
U.S. Cl. 16—111 R 7 Claims



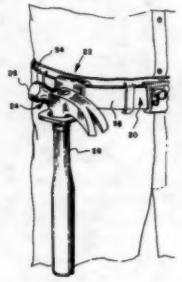
1. A handle assembly for a unit such as an oven door, comprising an elongated handle grip section and an end cap at each end of said handle grip section, said handle grip section being a longitudinally split tubular member having longitudinal edges defining said split, said longitudinal edges having inturned flanges, said end caps each having means for engaging and mounting an end of said handle grip section alternatively in either of two angularly spaced rotative positions, said engaging and mounting means comprising an outer wall defining a socket receiving said handle grip section, and support means inwardly of said wall fitting within the hollow interior of said handle grip section and relieved at angularly spaced locations to accommodate said flanges in both of said two angularly spaced rotative positions.

4,638,530

TOOL CARRIER

Roger A. Perry, 15 Pruett Pl., Oakdale, Conn. 06370

Filed Oct. 9, 1981, Ser. No. 310,044
Int. Cl.[4] A44B 21/00
U.S. Cl. 24—3 L 5 Claims



1. A tool carrier for suspending from a person's belt a hammer of the type having a head with two ends and a handle extending transversely of the head from a location intermediate the ends of the head comprising:

a cradle including a base for supporting at spaced locations the head of the hammer and having an opening adapted to freely receive therethrough the handle of the hammer; and

mounting means for releasably suspending said cradle from a person's belt such that when the head of the hammer is supported on said cradle, the head lies in a plane beneath the plane of the belt, said mounting means including at least one forward member having upper and lower ends and at least one associated rear member having upper and lower ends, said forward and rear members lying in spaced apart generally parallel planes, bridge means joining said forward and rear members at said upper ends, said forward and rear members defining a belt receiving slot therebetween such that when said tool carrier is in its operational position, said rear member lies between the inside surface of the belt and the person's body and said forward member lies contiguous to the outer surface of the belt;

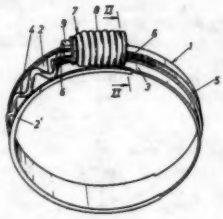
said cradle being joined to said rear member at said lower end thereof and lying in a plane generally transverse of said rear member, said forward member terminating above said cradle a distance generally equivalent to the width of the belt to enable the belt to be received in the belt receiving slot between said forward and rear members.

4,638,531

HOSE CLAMP

Sven Ribrant, Färjestaden, Sweden, assignor to Allmanna Brandreskapsaffaren AB, Stockholm, Sweden

PCT No. PCT/SE85/00034, § 371 Date Sep. 20, 1985, § 102(e) Date Sep. 20, 1985, PCT Pub. No. WO85/03336, PCT Pub. Date Aug. 1, 1985
PCT Filed Jan. 29, 1985, Ser. No. 779,776
Claims priority, application Sweden, Jan. 30, 1984, 8400435
Int. Cl.[4] B65D 63/02
U.S. Cl. 24—274 R 4 Claims



1. An improved hose clamp comprising a tightening band bent to annular shape, end portions on said tightening band, transverse grooves provided in a first of said end portions of said tightening band, a screw worm having threads therein, said transverse grooves in said first end portion engaging in said screw worm threads, a sleeve enclosing said screw worm, said screw worm being rotatably journalled in said sleeve but axially non-slidable therein, a space in said sleeve allowing said threaded tightening band end portion to be moved out of said sleeve upon rotation of said screw worm therein, a second of said tightening band end portions opposite said first band end portion being fixed to said sleeve, a pressure strap bent to annular shape with its end portions overlapping, said tightening band being elastic in its lengthwise direction and enclosing said pressure strap, said pressure strap arranged to form a guide means to said screw worm sleeve and to said tightening band between said sleeve and said tightening band and an enclosed article, the improvement comprising said tightening band having an arcuate configuration in the plane of the external face of said pressure strap along the major portion of the circumference of said pressure strap, said arcuate configuration being adapted to resiliently deflect upon tightening of said tightening band for maintaining a substantial uniform pressure upon said pressure band during time.

4,638,532

MECHANICAL FASTENING SYSTEM

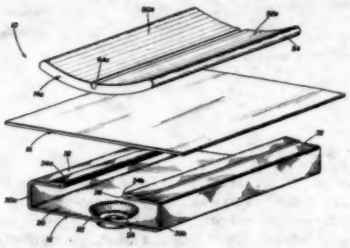
James H. C. Yang, Cleveland, and Walter Tomaszewski, Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 516,622, Jul. 25, 1983, abandoned. This application Apr. 18, 1985, Ser. No. 724,054

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] A44B *21/00*; E04B *1/00*

U.S. Cl. 24—462 22 Claims



1. An attachment device for mechanically securing at least one flexible elastomeric sheet to the upper surface of a roof, said attachment device comprising a substantially rigid channel member and an insert member for retaining at least one said elastomeric sheet within said channel member and over said roof, said channel member having a top wall, bottom wall, a rectangular cross-section, and a continuous central longitudinal slot in said top wall opening into said channel member, opposed side walls which are substantially flat and which are arranged in parallel, said side walls being substantially perpendicular to said top and bottom walls, and means for receiving a fastening element to attach the channel member to said upper roof surface, said receiving means being positioned within the bottom wall of said channel member and said channel member having a width which is defined by said opposed side walls, said insert member comprising cans for maintaining said at least one flexible elastomeric sheet in said channel member, said insert member being formed from a resilient material and having two outer arcuate edges which define between them a lateral extent less than the width of said channel member when said insert member is unflexed, said insert member also comprising a central longitudinal flex notch in one surface which defines two adjacent insert member wing portions and which comprises means for facilitating the temporary elastic deformation of said insert member from a first position in which said insert member has a substantially unflexed natural shape into a second position in which said insert member has a generally inverted V-shape so that said edges can be inserted, together with a portion of said at least one elastomeric sheet, through said slot and into said channel member, by deforming said insert member along said flex notch and without deforming said top wall or said side walls of said channel member, said insert member and said longitudinal flex notch together comprising means for maintaining said at least one elastomeric sheet against an interior surface of said channel member when said insert member is substantially flattened into a third position in which the shape of said insert member is returned approximately to said natural shape, thereby permitting lateral and vertical shifting of said insert member and said at least one flexible sheet within said channel member.

4,638,533

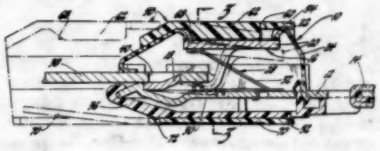
VARIABLE RELEASE SEAT BELT BUCKLE

Lawrence A. Gloomis, Sterling Heights, and Gregory S. Ches, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1985, Ser. No. 723,571

Int. Cl.[4] A44B *11/26*

U.S. Cl. 24—633 2 Claims



1. An assembly comprising a seat belt buckle and a device selectively unable for increasing the release force of said seat belt buckle of the type having a brickle housing with a top cover and a spring loaded pushbutton accessible for depression by the occupant through a pushbutton opening recessed below the surface of said top cover of said buckle housing also having a bottom cover, said device comprising:

a molded plastic tubular sleeve slidably and removably installed onto the buckle and having a top wall overlying the top cover of the buckle and a bottom wall underlying the bottom cover of the buckle, said top wall having a U-shaped slit molded integrally therein and defining a pushbutton flap registering with the pushbutton in overlying relationship therewith and integrally connected to the tubular sleeve by an integral living hinge axis, said pushbutton flap having an underside of increased thickness so that the pushbutton flap depends into the pushbutton opening of the buckle housing top cover to thereby retain the sleeve on the buckle and engage with the pushbutton at least upon depression of the pushbutton flap to concomitantly depress the pushbutton of the buckle, said pushbutton flap further having an angled cam face on the underside thereof so that sliding movement of the sleeve to remove the sleeve from the buckle imparts an upward pivotal movement to the pushbutton flap with respect to the pushbutton opening to enable said sliding removal of the sleeve.

4,638,534

PIVOT STRUCTURE FOR SEAT BELT BUCKLE

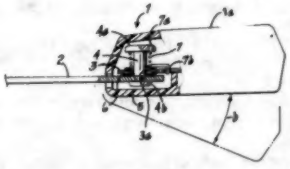
Kiichi Sasaki, Saitama, and Iimuro Takashi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,615

Claims priority, application Japan, Sep. 19, 1984, 59-142087[U]

Int. Cl.[4] A44B *11/00*; A62B *35/00*

U.S. Cl. 24—683 5 Claims



1. Pivot structure for a seat belt buckle which is supported on a free end of a substantially rigid anchor stay, wherein: a base plate of the seat belt buckle is connected to a free end of the anchor stay by way of a pin in such a manner that the base plate is rotatable about the pin along a plane of a major surface

of the free end of the anchor stay and is free to incline relative to the major plane, the base plate is biased by spring means towards a position in which the base plate aligns with an axial line of the anchor stay, and said spring means comprises a coil spring fitted over the pin with one end of the coil spring engaged to the pin while the other end of the coil spring is engaged to the base plate.

4,638,535

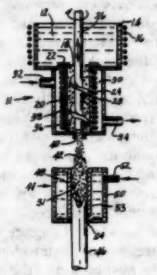
APPARATUS FOR FORMING A THIXOFORGED COPPER BASE ALLOY CARTRIDGE CASING

Michael J. Pryor, Woodbridge; Joseph Winter, New Haven, and Jonathan A. Dantzig, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 616,022, May 31, 1984, abandoned, which is a division of Ser. No. 337,560, Jan. 6, 1982, Pat. No. 4,494,461. This application Dec. 2, 1985, Ser. No. 803,280

Int. Cl.[4] B21D *51/54*

U.S. Cl. 29—1.3 **16 Claims**



1. An apparatus for forming a cartridge casing, said apparatus comprising:

means for forming a semi-solid slurry from an age-hardenable copper base alloy;

means for forging said copper base slurry into said cartridge casing, said cartridge casing being a thin-walled, elongated member; and

means for age-hardening said forged cartridge casing.

4,638,536

METHOD OF MAKING A RESONATOR HAVING A DESIRED FREQUENCY FROM A QUARTZ CRYSTAL RESONATOR PLATE

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 17, 1986, Ser. No. 819,652

Int. Cl.[4] H01L *41/22*

U.S. Cl. 29—25.35 **16 Claims**

1. Method of making a resonator having a desired frequency from a quartz crystal resonator plate, said method including the steps of:

(A) etching the quartz crystal resonator plate to a frequency slightly higher than the desired frequency,

(B) depositing metallic electrodes onto the active area of the resonator plate to lower the frequency to a frequency that very closely approaches the desired frequency, and

(C) treating the plate with the deposited electrodes with UV-ozone to oxidize the electrodes in a slow, precisely controlled manner to the desired frequency.

4,638,537

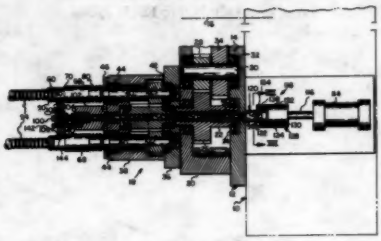
CONCISE QUICK RELEASE TOOL HOLDER

Gary L. Baker, Portland, Mich., assignor to Crankshaft Machine Company, Jackson, Mich.

Filed Apr. 22, 1985, Ser. No. 725,494

Int. Cl.[4] B23B *3/18, 7/04*

U.S. Cl. 29—40 **10 Claims**



1. A quick release tool holder system for machine tools characterized by its concise configuration and ability to simultaneously release and hold a plurality of adjacent tools comprising, in combination, a frame, a machine tool head mounted on said frame, a plurality of elongated spindles mounted upon said head parallel to and substantially equally radially spaced from a center axis and each rotatable about its own spindle axis, drive means mounted on said head drivingly connected to said spindles for simultaneously rotating said spindles, each spindle including a free end, a socket defined in each spindle free end concentric to the associated spindle axis and shaped to receive a standard tool adapter, an annular sleeve exteriorly mounted upon each spindle in axial alignment with the associated socket and axially displaceable thereon in opposite tool releasing and tool holding directions, detent means mounted on each spindle interposed between the associated sleeve and socket operatively connected to the associated sleeve engaging and holding a tool adapter in said socket when the associated sleeve is moved in its tool holding direction and releasing the tool adapter when the asssociated sleeve is moved in its tool releasing direction, a sleeve actuator simultaneously operatively associated with the sleeves of all the tool spindles associated with a common center axis for simultaneously displacing all of the sleeves thereof in said tool releasing direction, and means connected to said actuator for axially displacing said actuator in a direction parallel to said center axis to simultaneously displace said sleeves in said tool releasing direction.

4,638,538

METHOD OF MANUFACTURING WOUND BUSH BEARING WITH NOTCH-FREE FLANGE AND MOLD ASSEMBLY FOR MANUFACTURING THE SAME

Masayuki Kohama, Moriyama; Tatsuro Wakabayashi, and Kouichi Tsunoda, both of Shiga, all of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,656

Claims priority, application Japan, Apr. 28, 1983, 58-74068

Int. Cl.[4] B21D *53/10, 22/08*

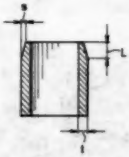
U.S. Cl. 29—149.5 C **7 Claims**

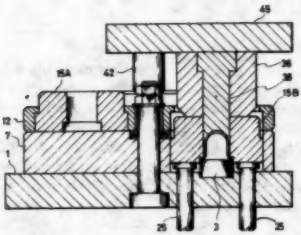
1. A method of manufacturing a wound bush bearing with a notch-free flange, comprising the steps of:

(a) preparing a cylindrical bush workpiece having one end portion and another end portion along an axial direction thereof, said one end portion being uniformly tapered at at least one of the outer and inner circumferential surfaces thereof so that the radial thickness of said one end portion is gradually decreased toward one end of said workpiece, the length of said one end portion in said axial direction of said workpiece being greater than the width of a rear face of a notch-free flange to be formed;

(b) applying an axial pressing force at one of the end portions

of said workpiece and varying continuously from a radially outward direction to said axial direction a vector direction of a bending force applied to said one end of said workpiece by the pressing force so that said one end portion is bent radially outward in order to form said one end portion into a flange part; and



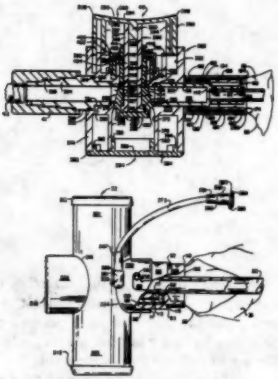


(c) further applying said pressing force in said axial direction while restricting the radially outward movement of said one end portion of said workpiece after step (b) in order to form said notch-free flange from said flange part.

4,638,539
ASPIRATING/VENTILATING APPARATUS AND METHOD

Darrel Palmer, Sandy, Utah, assignor to Ballard Medical Products, Midvale, Utah

Division of Ser. No. 633,570, Jul. 23, 1984, Pat. No. 4,569,344. This application Aug. 20, 1985, Ser. No. 767,400
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—157 R 1 Claim



1. A method of manufacturing a ventilating/aspirating assembly comprising the steps of:

assembling a manual aspirating control valve by placing a plunger in a closed end of an exteriorally tapered elastic seal member and placing the plunger/sealing member assembly within a tapered sealing bore of a valve body having an open top and an open bottom, folding a wall which comprises an open end of the sealing member upon itself in reverse curve orientation, anchoring and sealing said wall in said reverse curve orientation in stretch fit relation thereby biasing the sealing member into a closed sealing position by forces comprising the memory of the material from which the sealing member is made;

placing a bottom closure and a top actuator upon the valve body following installation of the plunger/sealing member assembly;

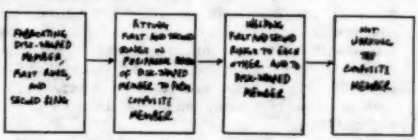
linearly force-fit connecting the distal and proximal ends of a sterility preserving flexible manually collapsible envelope respectively between a ventilating/aspirating fitting and the manual aspirating control valve;

stationarily connecting the proximal end of an aspirating catheter tube to the aspirating control valve and slidably associating the distal end of the catheter tube with the ventilating/aspirating fitting.

4,638,540
METHOD FOR MANUFACTURING RAILWAY WHEELS

Ake Hasselöf; Carl-Gustaf Lenasson, and Lennart Nordhall, all of Surahammar, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Dec. 31, 1984, Ser. No. 687,759
Claims priority, application Sweden, Jan. 3, 1984, 8400020
Int. Cl.[4] B21H *1/04*
U.S. Cl. 29—168 9 Claims



1. A method for making a near-finished wheel blank for use in manufacturing a railway wheel which has a base region, a flange region and a tread region, said flange region being divided into first and second portions and said tread region being divided into first and second portions, the second portion of said flange region abutting the first portion of said tread region, said base region and said first portion of said flange region being made of a first material, at least said second portion of said flange region being made of a second material which is more wear-resistant than said first material, and said second portion of said tread region being made of a third material which has a higher frictional resistance than said first material, said method including the steps of

(1) fabricating (a) a first component part from said first material which is shaped to form said base region and said first portion of said flange region, (b) a second component part from said second material which is shaped to form at least said second portion of said flange region, and (c) a third component part from said third material which is shaped to form said second portion of said tread region, said first, second and third component parts being shaped to fit closely against each other,

(2) machining and cleaning each of said first, second and third component parts to remove impurities therefrom,

(3) fitting together said first, second and third component parts so as to form a composite member,

(4) welding said first, second and third component parts together along their abutting edges which are exposed such that air cannot enter said composite member between said component parts, and

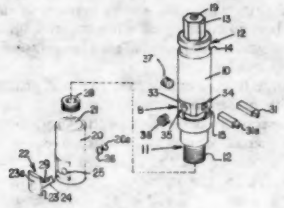
(5) hot-working said composite member to provide a good bond between said first, second and third component parts and to provide said near-finished wheel blank.

4,638,541

TOOLS FOR REPAIRING A DIESEL ENGINE CYLINDER HEAD

Edward F. Schindler, Jr., 4917 Orange Grove Dr., Houston, Tex. 77039

Filed Jun. 22, 1984, Ser. No. 623,380
Int. Cl.[4] B23P *6/02, 19/08;* B25B *13/08*
U.S. Cl. 29—402.06 32 Claims



1. A repair tool for cutting and enlarging a retainer ring groove in a pushrod bore, having an open top end and a bottom end closed by a cam follower, of a Detroit diesel engine cylinder head while the cylinder head is mounted to a Detroit diesel engine block, a portion of the pushrod bore where the retainer ring groove is located including a gap in the circumference of the pushrod bore in which a tool projecting beyond a radius of the pushrod bore can fit, the tool comprising:

a tubular cutting element having a longitudinal axial bore, adapted to fit within said pushrod bore around a pushrod to enlarge the retainer ring groove in said pushrod bore;

a tubular spacing and anchor element threadedly interconnected with said tubular cutting element having a longitudinal axial bore, adapted to fit within said pushrod bore around a pushrod, below said cutting member, in contact with the cam follower at the bottom closed end of the pushrod bore;

means for radially orienting a cutting member on said cutting element to project beyond the pushrod bore a predetermined distance; and

means for rotating the cutting element when the repair tool is oriented in the pushrod bore with the cutting element and stop and anchor element threadedly interconnected and oriented in the pushrod bore around a pushrod with the cutting element positioned in the gap, for cutting and enlarging the retainer ring groove.

4,638,542

METHOD AND APPARATUS FOR FORMING ELEMENT-FREE SPACES IN SLIDE FASTENER CHAINS

Hideki Akiyama, Toyama, and Shigeru Imai, Namerikawa, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

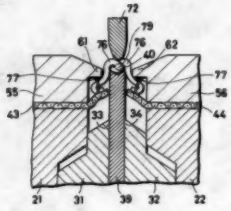
Filed Jun. 22, 1984, Ser. No. 623,116
Claims priority, application Japan, Jun. 28, 1983, 58-116300; Jul. 2, 1983, 58-103089[U]
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—408 10 Claims

1. A method of forming an element-free space in a slide fastener chain composed of a pair of stringer tapes supporting an intermeshing row of coupling elements secured to confronting longitudinal edges of the stringer tapes by sewing threads and having coupling heads and lower legs disposed on the upper sides of the respective stringer tapes, comprising the steps of:

(a) gripping the stringer tapes by upper grippers and lower grippers with the coupling elements spaced vertically and directed away from a pair of spaced fixed cutter blades;

(b) lowering the upwardly facing coupling heads with a punch blade acting thereon to tilt the coupling elements and the marginal edges of the stringer tapes downwardly towards the spaced fixed cutter blades for thereby angularly spreading the confronting tape edges such that the spaced fixed cutter blades pass between the spread confronting tape edges and then engage the lower tape-engaging legs of the coupling elements at positions which are disposed close to the confronting tape edges;

(c) continuously depressing the coupling heads further to push the lower legs against the spaced fixed cutter blades, thereby cutting off the lower tape-engaging legs of the coupling elements on the fixed cutter blades;



(d) lifting the severed coupling elements away from said fixed cutter blades while they are being clamped between the punch blade and a knockout blade vertically aligned therewith until the severed coupling elements pulled out of engagement with the sewing threads; and

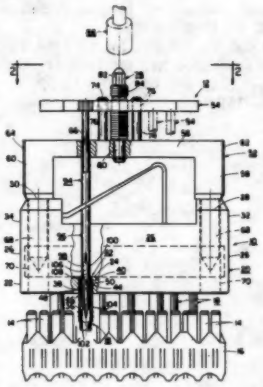
(e) holding the sewing threads in engagement with overlying portions of the upper grippers during the pulling portion of said lifting step (d).

4,638,543

LOCKING TUBE REMOVAL FIXTURE AND METHOD IN A RECONSTITUTABLE FUEL ASSEMBLY

John M. Shallenberger, Fox Chapel, and Stephen J. Ferlan, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1985, Ser. No. 695,762
Int. Cl.[4] B23P *19/00, 17/00;* B23Q *13/14*
U.S. Cl. 29—426.5 11 Claims



11. For use with a reconstitutable fuel assembly including a top nozzle with an adapter plate having at least one passageway, at least one guide thimble with an upper end portion and an attaching structure having a hollow locking tube for releasably locking the upper end portion of the guide thimble within the passageway of the top nozzle adapter plate, a method for removing the locking tube from its locking position, comprising the steps of:

(a) disposing a locking tube engaging means having a lower

segmented rim within an opening in a tool guide and extending downward therefrom;

(b) positioning the tool guide on the top nozzle so as to align its opening with the passageway of the top nozzle adapter plate and extend the locking tube engaging means through the locking tube in the upper end portion of the guide thimble positioned within the passageway with the segmented rim of the tube engaging means disposed at a level below a lower edge of the locking tube; and

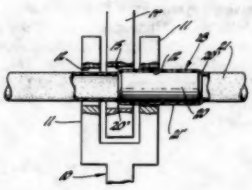
(c) moving a tool holder having an elongated actuating means mounted thereon and extending through the tube engaging means from a first to a second position so as to move the actuating means from a disengaged to an engaged position and thereby the tube engaging means from a collapsed to an expanded position in which its segmented rim is expanded from a position in which it is withdrawn from under the lower edge of the locking tube to a position underlying the lower edge of the locking tube so that the locking tube will be removed from its locking position by the tube engaging means upon withdrawal of the tool guide and the tool holder therewith from the top nozzle.

4,638,544

PLASTIC COVERED FASTENING DEVICE AND METHOD OF ASSEMBLY

James E. McNeil, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 9, 1985, Ser. No. 806,636
Int. Cl.[4] E05D *5/10*
U.S. Cl. 29—434 **5 Claims**



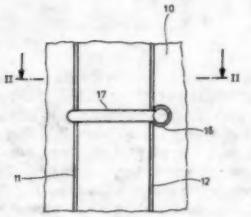
1. A method for securing a first element with at least one aperture therein of a predetermined internal diameter to a second element with at least one aperture therein of predetermined internal diameter located coaxial with said aperture in said first element by means of a plastic coated fastening device including the steps of inserting a rigid pin into a tube of resilient, plastic material of a predetermined nominal exterior diameter; applying an axial tension force to said tube whereby to reduce the effective external diameter of the combined pin and tube to a size less than that of the apertures; threading an end of said tube through said coaxial apertures; then, while still applying the axial tension force, axially moving said tube and said pin until said pin and the pin encircling portion of said tube are located in said apertures; releasing the tension force on said tube whereby said pin encircling portion of said tube can then expand radially outward to effect axial securement of said pin relative to at least said one aperture in said first element; and, trimming said tube adjacent to opposite ends of said pin.

4,638,545

PROCEDURE FOR COATING AND HEAT INSULATING OF WALLS AND CEILINGS, ETC., AND DEVICE FOR CARRYING OUT THE PROCEDURE

Hans Bingener, Friedrichshafen, Fed. Rep. of Germany, assignor to Durol Flying Lindauer Ikh Montage GmbH, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,713
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407459
Int. Cl.[4] B23P *19/04*; E04C *1/00, 3/16*; E04F *13/06*
U.S. Cl. 29—460 **8 Claims**



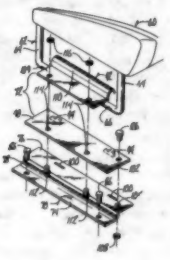
1. A method of applying an insulation coating to a wall surface, comprising applying strips of a length of the insulation coating to be applied to the wall surface, so that the strips are disposed outwardly of the wall surface up to the desired thickness of the insulation coating and so that the strips are fixed to the wall surface, the strips defining a space therebetween, spraying the coating between adjacent strips to fill the space therebetween and to a thickness at least up to the surface of the strips, and thereafter smoothing the coating which has been applied back to the desired thickness of the insulation coating and back to a plane which abuts outer portions of the strips.

4,638,546

METHOD AND MEANS FOR MOUNTING A VEHICLE SEAT

Steven C. Benshoof, 2816 Lyon St., Des Moines, Iowa 50317

Continuation-in-part of Ser. No. 609,966, May 14, 1984, abandoned. This application Nov. 5, 1985, Ser. No. 795,190
Int. Cl.[4] B23P *19/00*; B60N *1/00*
U.S. Cl. 29—526 R **4 Claims**



1. A bracket for securing a seat to the floor of a vehicle, said vehicle having a longitudinal centerline, said seat having a horizontal tubular member thereon, said bracket comprising:

a floor plate means having more than one floor plate bolt hole therein for anchoring said floor plate means to said vehicle floor, said floor plate means having a raised horizontal portion which is spaced above and parallel to said vehicle floor when said floor plate means is anchored to said vehicle floor;

said horizontal portion having at least two elongated bayo-

net slots therein and a round first bolt hole extending therethrough in spaced relation to said bayonet slots, said bayonet slots each having opposite ends and extending in a direction parallel to said longitudinal axis of said vehicle;

a base plate means having attachment means for securing said base plate means to said floor plate means and further having tube engaging means for retentively engaging said tubular member of said seat;

said attachment means comprising at least two spaced apart integral bayonet members, each of said bayonet members comprising a downwardly extending leg and a finger extending in a direction parallel to said longitudinal axis of said vehicle.

4,638,547

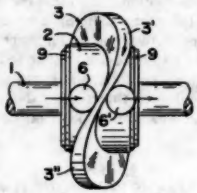
PROCESS FOR PRODUCING A CAM WITH SINUSOIDAL CAM LOBE SURFACES

Francis E. Waller, Dover, Fla., assignor to Leonard J. E. Waller, Palm Harbor; Wm. J. Gdovin, New Port Richey and Walter J. Monacelli, St. Peter, all of, Fla., a part interest to each

Continuation-in-part of Ser. No. 582,262, Feb. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 420,390, Sep. 20, 1982, abandoned, which is a division of Ser. No. 320,213, Nov. 12, 1981, Pat. No. 4,432,310, which is a continuation of Ser. No. 265,559, May 19, 1981, abandoned, which is a continuation of Ser. No. 35,553, May 3, 1979, abandoned. This application Aug. 1, 1985, Ser. No. 761,488

Int. Cl.[4] B23P *13/04*; B23C *3/08*

U.S. Cl. 29—558 **3 Claims**



1. The process of preparing an original cam with sinusoidal cam lobe surfaces which comprises: (1) rotating a cylinder of appropriate material about its cylindrical axis; (2) rotating a cutting or grinding tool near a flat end portion of said cylinder; (3) advancing said flat end portion of said cylinder, while being rotated, into a cutting or grinding relationship with the side of said cutting or grinding tool at a controlled rate and then retracting said end portion of said cylinder away from said cutting or grinding tool at said same controlled rate, the said controlled rate being such that there are at least two advancements of said cylinder toward said tool per revolution of said cylinder and at least two retractions per revolution of said cylinder, the amount of advancement in each case being in accordance with the capacity of said cutting or grinding tool; (4) advancing incrementally the supporting means for said cylinder and for the advancing and retracting means for said cylinder, said incremental advancing supporting means being independent of the said supporting and activating means for said cutting or grinding tool, the increments of said advancing of said supporting means being no greater than the capacity of said cutting or grinding tool, the said incremental advancement of said supporting means being continued until the desired depth of the reverse rise has been cut in the said end of said cylinder; and (5) thereafter repeating above steps (1) through (4) until there has been cut two or more rises and two or more reverse rises in the opposite end of said cylinder by a cutting or grinding tool positioned at the opposite end of said cylinder, said rises at one side of said cam lobe being opposite the reverse rises in the other side of said cam lobe, and the distance between a reverse rise on one of said sinusoidal cam lobe surfaces from the opposite rise on the other of said sinusoidal cam lobe surfaces gives the desired cam lobe thickness.

4,638,548

METHOD OF FORMING A HELICAL BALL SCREW MEMBER

Michael A. Miller, Metamora, Mich., assignor to 20th Century Machine, Sterling Heights, Mich.

Filed Feb. 8, 1984, Ser. No. 578,379

Int. Cl.[4] B23P *13/04*; B24B *5/00*; F16H *1/14*

U.S. Cl. 29—558 **17 Claims**

1. A method of forming a ball screw member from a workpiece having a first end, a second end opposite said first end, a longitudinal axis extending from said first end to said second end, a cylindrical portion interposed said first end and said second end, and a cylindrical outer surface on said cylindrical portion, said method comprising:

a first machining step of machining a helical ball screw thread in said cylindrical outer surface, said helical ball screw thread being located during said first machining step relative to said cylindrical outer surface, said helical ball screw thread having a partial circular cross-sectioned helical groove and a helical crest surface adjacent thereto; and

a second machining step of machining end treatments on said workpiece adjacent said first end of said workpiece, said end treatments being located during said second machining step relative to said helical crest surface.

4,638,549

APPARATUS FOR MANUFACTURING ELECTRICAL HARNESSES

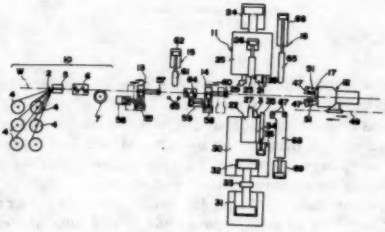
Takashi Okazaki, Toyonakashi; Yukio Matsu'ura, Takatsukishi, and Yoshihiko Saijo, Ibaragishi, all of Japan, assignors to Nippon Acchakutanshi Seizo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 13, 1985, Ser. No. 775,772

Claims priority, application Japan, Sep. 13, 1984, 59-192267

Int. Cl.[4] B23P *23/00*; H01R *43/05, 43/01*

U.S. Cl. 29—564.4 **4 Claims**



1. Apparatus for making electrical harnesses including wires and electrical connectors, the apparatus comprising:

a wire feed path extending and substantially horizontally and axially of the apparatus;

a connector attaching device comprising a co-operating assembling punch and die pair disposed on respective sides of the wire feed path, and a wire cutting blade located adjacent to the punch and die pair;

a connector supplying device for supplying the connectors to the assembling die;

a first chuck reciprocally movable along the wire feed path for pulling out the wires in an advancing movement for a distance corresponding to a desired length of the electrical harness;

a second chuck for holding the supplied wires laterally at equal intervals, and guiding the same to the connector attaching device along the wire feed path, the second chuck reciprocally movable in a small range during which movement to align top ends of the wires;

an insulation covering stripping device mounted on the second chuck;

whereby, upon operation, the wires supplied to the connector attaching device are pulled out by the first chuck to a desired length from a connector attaching position; then the insulation covering stripping device being operated to slit insulation covering of each wire, and the connector attaching device being operated to cut the wires to a desired length, and attach one of said connectors to tail ends of the wires.

4,638,550

HORIZONTAL DRILLING AND MILLING MACHINE

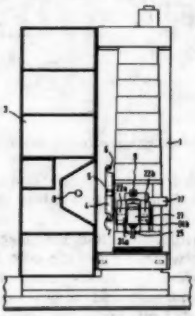
Matthias Malzkorn, Jüchen, Fed. Rep. of Germany, assignor to Scharmann GmbH & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 533,252

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234498

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **12 Claims**



1. A horizontal drilling and milling machine having a work table with a workpiece thereon undergoing a rotation in a horizontal plane such that even the most difficult workpieces, without having to be reclamped and tilted, can be machined on five sides accurately at all angles of application of a tool including accurate drilling of bores via such tool being brought into horizontally respectively vertically inclined positioning, said machine comprising:

a vertically extending column;

a headstock movable up and down on said column;

a rotatable drive drilling spindle which is provided with means for operative connection thereof with said headstock and having a central longitudinal axis therewith;

an angle-cutting milling head provided with a milling spindle and a drive shaft, means coupling said shaft to be coaxially directly engaged and driven by said drilling spindle; said milling head being provided with means for rotary indexing thereof about said longitudinal axis of said drilling spindle for exact positioning of a tool in a working position thereof taking into consideration encountering of torque and reaction forces exerted between said headstock and said tool, and being further provided with means for said milling head to be pivoted into a tool exchanging position about an axis which extends at right angles to said longitudinal axis of said drilling spindle.

4,638,551

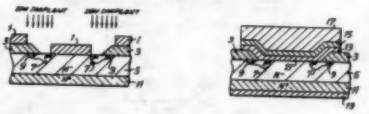
SCHOTTKY BARRIER DEVICE AND METHOD OF MANUFACTURE

Willem G. Einthoven, Belle Mead, N.J., assignor to General Instrument Corporation, New York, N.Y.

Continuation of Ser. No. 422,386, Sep. 24, 1982, abandoned. This application Feb. 21, 1985, Ser. No. 703,703

Int. Cl.[4] H01L *29/48*

U.S. Cl. 29—571 **12 Claims**



1. A method of manufacturing a Schottky barrier device comprising:

(a) providing a semiconductor layer of a first conductivity type;

(b) forming an insulating layer over one face of the semiconductor layer;

(c) forming an opening in the insulating layer;

(d) depositing a photoresistant layer over the insulating layer and over the semiconductor layer where it is exposed by the opening in the insulating layer;

(e) forming an opening in the photoresistant layer surrounding the periphery of the opening in the insulating layer such that adjacent areas of the insulating and semiconductor layers are exposed;

(f) directing activated ions of the type producing a conductivity opposite to that of the semiconductor layer at the opening in the photoresistant layer for introduction into the semiconductor layer below said opening, the energy of the ions being such that the insulating layer acts as a partial shield to the ions.

(g) removing the photoresistant layer;

(h) depositing a conductor layer over the semiconductor layer where it is exposed by the opening in the insulating layer.

4,638,552

METHOD OF MANUFACTURING SEMICONDUCTOR SUBSTRATE

Masaru Shimbo; Kiyoshi Fukuda, and Yoshiaki Ohwada, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 14, 1985, Ser. No. 701,516

Claims priority, application Japan, May 9, 1984, 59-92442; May 9, 1984, 59-92443

Int. Cl.[4] H01L *21/302, 21/76*

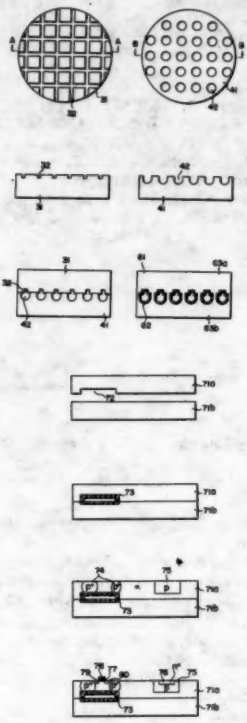
U.S. Cl. 29—576 J **15 Claims**

1. A method of manufacturing a semiconductor substrate having a modified layer therein, comprising the steps of:

mirror-polishing one surface of each of first and second semiconductor plates;

forming a modified layer on at least one of the polished surfaces of said first and second semiconductor plates; and

bonding the polished surfaces of said first and second semiconductor plates with each other in a clean atmosphere



without thermal fusing of said first and second semiconductor plates.

4,638,553

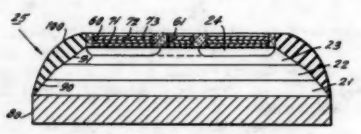
METHOD OF MANUFACTURE OF SEMICONDUCTOR DEVICE

Anders Nilarp, Rancho Palos Verdes, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Division of Ser. No. 447,760, Dec. 8, 1982. This application Oct. 4, 1985, Ser. No. 784,177

Int. Cl.[4] H01L *21/302, 29/743*

U.S. Cl. 29—580 **22 Claims**



1. The method of making a plurality of semiconductor devices which are simultaneously processed and metallized with plural metallizing layers while said devices constitute parts of a common thin, flat silicon wafer having substantially parallel first and second surfaces; said metallizing being intimately secured in ohmic contact with a plurality of spaced portions of said first surface and being capable of withstanding temperatures which are encountered in subsequent processing steps; said metallizing including a non-junction-forming metal in contact with said first surface of said wafer and an outer solderable metal layer which is non-reactive to a caustic etch; said method comprising the steps of: separating a plurality of wafer elements from said wafer with each of said wafer elements having at least one respective metallizing area on at least a portion of the first surface thereof; securing a respective expansion plate contact to the second surface of each of said wafer elements; and etching the outer periphery of each of said wafer elements with a caustic etch.

4,638,554

METHOD OF CONSTRUCTING TRANSFORMERS USING A TRANSFORMER-COIL WINDING WHEEL

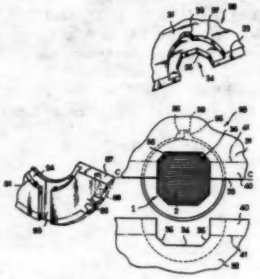
Jean-Claude Beisser, La Chaux de Fonds, France, assignor to Societe Nouvelle Transfix, Cahors, France

Division of Ser. No. 466,660, Feb. 15, 1983, Pat. No. 4,542,362. This application Aug. 3, 1984, Ser. No. 637,330

Claims priority, application France, Feb. 19, 1982, 82 02753; Feb. 19, 1982, 82 02754

Int. Cl.[4] H01F *7/06*

U.S. Cl. 29—605 **2 Claims**



1. A method of constructing a transformer, comprising the steps of:

forming a magnetic frame with at least one core and at least one yoke which define together at least one substantially rectangular window;

disposing an insulating tube around the magnetic core;

placing a driving wheel around the core and detachably coupling said wheel to at least one end of said tube;

winding electrical turns around the insulating tube by causing a movement of rotation of the wheel, while keeping end portions of the tube free from electrical turns;

removing the driving wheel from the tube;

interposing axially between the yoke and each end of an electric winding comprising the wound electric turns an annular spacer while centering a respective one of said end portions of the tube in a first aperture surface of the annular spacer, centering a second aperture surface of the annular spacer around the magnetic core, and abutting an annular end of the tube against an annular shoulder provided on the spacer between the two aperture surfaces.

4,638,555

SODIUM SULPHUR CELLS AND THEIR MANUFACTURE

Stuart MacLachlan, Runcorn, and Christopher O'Neill Bell, Great Sankey, both of United Kingdom, assignors to Chloride Silent Power Ltd., Runcorn, United Kingdom

Filed Jun. 26, 1985, Ser. No. 748,933

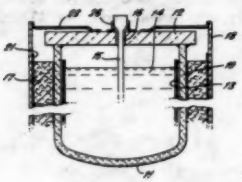
Claims priority, application United Kingdom, Jun. 26, 1984, 8416220

Int. Cl.[4] H01M *6/00;* **B23K** *35/36*

U.S. Cl. 29—623.1 **18 Claims**

1. A method of constructing an alkali metal energy conver-

sion device having an external casing, a solid electrolyte element dividing the interior of the casing into two electrode regions, an electrically insulating ceramic element joined to the electrolyte element, and at least one metal member sealed to



the insulating element, which method includes the steps of securing the metal member directly to the insulating ceramic element by thermocompression bonding before joining the insulating element to the electrolyte element by glazing.

4,638,556

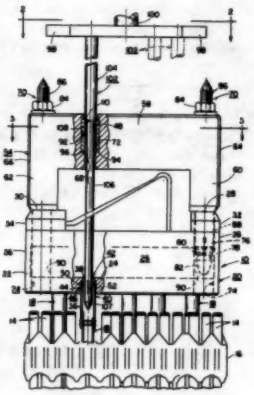
LOCKING TUBE INSERTION FIXTURE AND METHOD IN A RECONSTITUTABLE FUEL ASSEMBLY

John M. Shallenberger, Fox Chapel, and Stephen J. Ferlan, Wilkins Twp., Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 8, 1985, Ser. No. 689,696

Int. Cl.[4] B23P *19/00, 17/00;* **B23Q** *13/14*

U.S. Cl. 29—723 **14 Claims**



14. For use with a reconstitutable fuel assembly including a top nozzle with an adapter plate having at least one passageway, at least one guide thimble with an upper end portion and an attaching structure having a hollow locking tube for releasably locking the upper end portion of the guide thimble within the passageway of the top nozzle adapter plate, a method for inserting the locking tube into its locking position, comprising the steps of:

(a) releasably disposing a locking tube within an opening in a tool guide;

(b) locking the tool guide on the top nozzle so as to align its opening with the passageway of the top nozzle adapter plate and the locking tube disposed within the opening in alignment with the upper end portion of the guide thimble positioned within the passageway; and

(c) moving a tool holder having a locking tube insertion tool mounted thereon toward the tool guide so as initially to cause the tool to extend through the guide opening and locking tube and into the upper end portion of the guide thimble and thereafter to engage the locking tube causing its release from the tool guide opening and insertion into the guide thimble upper end portion to its locking position therein.

4,638,557

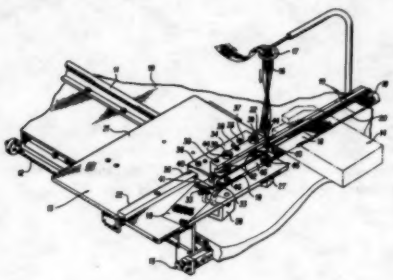
SEMI-AUTOMATIC APPARATUS FOR ATTACHING FLYPIECES TO A SLIDE FASTENER CHAIN

Sisir K. Sen Gupta, Meadville, Pa., assignor to Talon, Inc., Meadville, Pa.

Filed Jan. 24, 1986, Ser. No. 821,975

Int. Cl.[4] B21D *53/50;* **A41H** *37/06*

U.S. Cl. 29—766 **15 Claims**



1. In a machine for attaching flypieces to a slide fastener chain, a sewing machine, means to deliver a slide fastener chain to a sewing station defined by the sewing machine, and an apparatus to receive, orient and convey flypieces to the sewing station in a required sequence, said apparatus comprising a top plate on which flypieces can be randomly placed, a flypiece guide bar on said top plate with which flypieces can be engaged and guided on a path of movement toward the sewing station, conveyor belt means having a top run projecting somewhat above the top face of said top plate and adapted to engage flypieces on the top plate and shift them into engagement with said guide bar while conveying the flypieces toward the sewing station, and a cooperative adjustable flypiece guide and drag producing means on the top plate in overlying relationship to said top run of said conveyor belt means, whereby the machine can process flypieces of varying thicknesses and can maintain a desired uniform gapping or substantial abutment between the ends of flypieces passing through the machine.

4,638,558

WIRE PROCESSING METHOD AND APPARATUS

Homer L. Eaton, Leucadia, Calif., assignor to MTS Vektronics Corporation, Carlsbad, Calif.

Filed May 31, 1984, Ser. No. 615,933

Int. Cl.[4] H01R *43/04;* **B21F** *00/00;* **B65G** *15/14*

U.S. Cl. 29—861 **41 Claims**

1. The method of feeding a predetermined length of elongated material to a work station comprising

withdrawing said material from a material supply station,

feeding said material from said supply station to a temporary storage station,

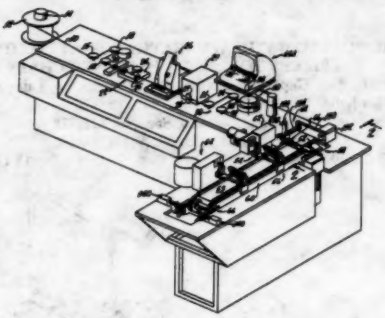
stopping withdrawal of material from the supply station when said predetermined length has been withdrawn,

withdrawing material from the storage station and feeding it to the work station, and

stopping withdrawal from the storage station when the amount of material in said storage station decreases to a predetermined amount.

11. The method of elongated material end processing comprising winding a length of material on a reel with at least a first end of the material projecting from the reel, grasping the projecting material end in a clamp, cutting the material adjacent the reel to sever a length of material on the reel from

material not yet wound on the reel, and moving the clamp to thereby transport the reel and material thereon to an end processing station to present said material end to said station while said length of material remains on said reel.

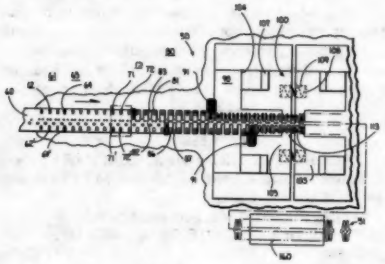


4,638,559

METHODS OF AND APPARATUS FOR MAKING SLOTTED BEAM CONTACT ELEMENTS

Charles McGonigal, Grayson, Ga., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Oct. 30, 1984, Ser. No. 666,526
Int. Cl.[4] H01R *43/16*
U.S. Cl. 29—874 **13 Claims**



1. A method of making a slotted beam contact element, said method comprising the steps of:

forming an opening in a strip of metallic material having major surfaces which are connected by edge surfaces;

forming a furcated beam in the strip with the furcations of the beam being spaced apart and with the opening being disposed between at least portions of inner edge surfaces of the furcations; and

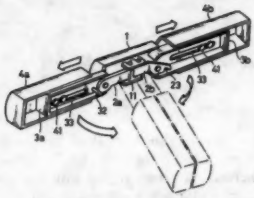
applying forces to at least one of the major surfaces at a location adjacent to an outer edge surface of at least one furcation to cause relative movement between the furcations to reduce the spacing therebetween and cause the portions of the inner edge surfaces to define a conductor-receiving slot having a predetermined configuration.

4,638,560

SAFETY RAZOR

Kanji Higashi, Omochanomachi, Japan, assignor to Kabushiki Kaisha Bandai, Japan

Filed Mar. 17, 1986, Ser. No. 840,078
Claims priority, application Japan, Oct. 17, 1985, 60-231758
Int. Cl.[4] B26B *21/00*
U.S. Cl. 30—47 **3 Claims**



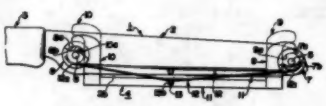
1. A safety razor comprising: a holding member for holding a razor blade; a pair of shaft members rotatably connected to the rear side of said holding member opposite to said razor blade; a pair of cover members each slidably connected to a corresponding one of said shaft members for covering said holding member when said shaft members are moved substantially in parallel with said holding member; and wherein said pair of shaft members each include first and second shaft members, said first shaft member being rotatably connected to the rear side of said holding member and said second shaft member being rotatably coupled to said first shaft member, wherein said cover members are each slidably connected to said second shaft member.

4,638,561

COMBINED KNIFE AND SLICER

Akira Koike, Takarazuka, Japan, assignor to Daishoku Kako Kabushiki Kaisha, Itami, Japan

Filed Jul. 18, 1985, Ser. No. 756,111
Claims priority, application Japan, Feb. 22, 1985, 60-24939[U]
Int. Cl.[4] B26B *3/03*
U.S. Cl. 30—284 **2 Claims**



1. A combined knife and slicer which comprises a generally elongated knife having a knife edge at one side thereof, a pair of spaced stub shafts connected to the opposite end portions of the blade so as to protrude laterally of the blade in the same direction, a generally elongated spacer guide comprising a spacer bar and a pair of generally plate-like support arms connected to the opposite ends of the spacer bar so as to extend in the same direction at right angles to the spacer bar, said support arms having their outer side edges slidingly received in circumferentially extending guide grooves in guide collars, one for each stub shaft, said guide collars threadingly mounted on each of the stub shafts for permitting the spacer guide to be adjustably supported by said stub shafts so as to extend in parallel relation to the longitudinal sense of the blade and also for adjusting the spacing between the spacer guide and the blade, said guide collars having two circumferentially extending guide grooves defined therein in which a respective portion of the spacer guide is slidingly guided, and a biasing element comprising a wire spring having a substantially intermediate portion secured to the spacer bar, said wire spring having

its opposite ends engaged in the second circumferentially extending groove in the respective collars for elastically urging the spacer guide so as to permit the spacer guide to assume a position spaced a distance from the knife edge in a direction parallel to the direction in which the blade is moved during a cutting procedure.

4,638,562

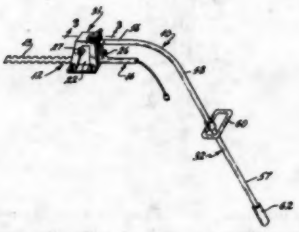
EXTENSION HANDLES FOR HEDGE TRIMMERS

Tom Drake, 130 Harbor Rd., Rye, N.H. 03870

Filed Feb. 26, 1986, Ser. No. 832,793

Int. Cl.[4] A01G *3/04*

U.S. Cl. 30—296 R **20 Claims**



1. A powered hedge trimmer apparatus comprising cutting blades driven by a motor mounted within a motor housing, said motor housing having oppositely oriented upper and lower, front and rear and spaced side wall portion, at least two elongated handle mounting means, each of said elongated handle mounting means being disposed along different one of said wall portions of said housing so as to be oriented outwardly of said housing in different alignment, an elongated handle means, said elongated handle means having first and second ends and an intermediate portion, said intermediate portions being generally curved so that said first and second ends of said handle means are angularly oriented with respect to one another, and means for selectively connecting said first end of said elongated handle means to either of said elongated handle mounting means so that said motor housing is supported by said elongated handle means.

4,638,563

TELESCOPING MEASURING STICK WITH SIGNAL MEANS

Egbert D. N. Buniff, 23674 Gerrad Way, Canoga Park, Calif. 91307

Continuation-in-part of Ser. No. 773,541, Sep. 9, 1985, abandoned. This application May 5, 1986, Ser. No. 859,715

Int. Cl.[4] G01B *3/08*

U.S. Cl. 33—169 R **4 Claims**

1. A telescoping measuring stick for determining the height of a cross-bar in an athletic event, comprising:

(a) a hollow outer tubular member, having marked thereon gradations of length;

(b) at least one nested inner slide member adapted to slide within an outer tubular member, haivng marked thereon gradations of length in association with gradations of length on said outer tubular member;

(c) means for clamping said at least one inner slide member at a pre-selected extended position; and

(d) an assembly for detecting the presence or absence of said cross-bar and for providing an indication of same, said assembly including:

(1) means for sensing said presence or absence of said cross-bar,

(2) at least one indicating means for indicating said presence or absence of said cross-bar, said indicating means cooperatively associated with said sensing means, and

(3) means for providing a source of power to activate said at least one indicating means upon sensing said presence of said cross-bar: said assembly comprises:

(a) a housing

(b) a mounting post for supporting said housing and adapted to be inserted in said inner slide member;

(c) a micro-switch assembly mounted on the bottom of said housing for indicating the height of said cross-bar;

(d) a light emitting diode mounted on said mounting post for indicating closure of said micro-switch;

(e) a buzzer mounted in said housing for indicating closure of said micro-switch; and

(f) means for providing a source of power to activate said light emitting diode and said buzzer upon closure of said micro-switch.

4,638,564

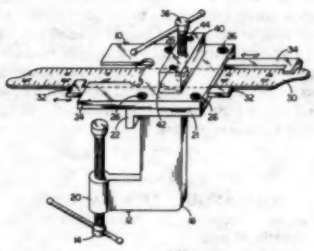
MEASURING GUIDE FOR SAW AND MEASURING GUIDE SYSTEM

Philip J. Burrows, 46 Cliff Dr., Narragansett, R.I. 02882

Filed Mar. 24, 1986, Ser. No. 842,904

Int. Cl.[4] B27B *9/04*; B43L *7/00*

U.S. Cl. 33—185 R **6 Claims**



1. A guide having a first planar surface for placement upon the surface of a workpiece and a second planar surface perpendicular to said first planar surface for placement against an edge of said workpiece, said guide having a firsl opening slidingly receiving a rule and second and third openings for slidingly receiving first and second indicators, first clamping means operative to clamp against the surface of said workpiece and second clamping means operative to clamp against the surface of said rule, and first and second indicators slidingly received within said second and third openings respectively, said rule being operative to extend over the surface of said workpiece and said first and said second indicators being oper-

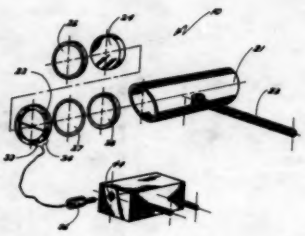
ative to extend over the surface of said rule to indicate a predetermined setting for said rule relative to the surface of said workpiece.

4,638,565

BOW SIGHT

Clayton J. Podany, 7317 Valley St., and Richard W. Glaseman, 6103 Oak St., both of Omaha, Nebr. 68124

Filed Oct. 3, 1979, Ser. No. 81,452
Int. Cl.[4] F41G *1/34*
U.S. Cl. 33—265 **4 Claims**



1. A sight for use with a weapon, the sight comprising:

housing means have a passage formed longitudinally therethrough;

mounting means secured to said housing means and projecting therefrom, said mounting means adapted for affixment to the weapon;

an aiming reference disposed in said passage, said aiming reference including a light source means for producing a light, said light source means including enclosed filament means for receiving electricity therethrough spaced from the walls of said passage, said filament means having a variable intensity and said electrical means including a variable means for adjusting said intensity, said aiming reference including a mounting unit laterally disposed in said housing and having an opening formed therein with said filament means disposed in said opening;

electrical means connected to said filament means for conducting electricity to said filament means;

power means connected to said electrical means wherein said filament means is energized thus producing light; and

said mounting means including a mounting ring formed from a non-conductive material, a pair of spaced copper bands affixed to said mounting means, a pair of leads, each secured on one end to one of said bands respectively with the other end of each lead secured to said filament means with said leads positioning said filament means at the center of said mounting ring.

4,638,566

HOLE ANGULARITY GAUGE

Douglas Thompson, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

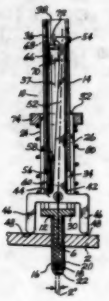
Filed Mar. 27, 1985, Ser. No. 716,663
Int. Cl.[4] *G01B 5/24*
U.S. Cl. 33—534 **17 Claims**

1. A gauge for measuring the deviation from a predetermined angle of the relative angle between a hole in an object and a surface of the object through which the hole extends, comprising:

a first member including an upper portion, and a lower portion that includes a downwardly tapered plug dimensioned to be snugly receivable into the hole; and having a use position in which the plug is so received into the hole;

a second member including an upper portion, and a lower portion positioned radially outwardly from the plug and having end surface means; said second member having a use position in which said end surface means contacts said surface of the object around the hole;

attaching means for slidably and pivotably attaching said members together, to slide upwardly and downwardly with respect to each other along a line toward and away from said use positions, and to pivot with respect to each other about a pivot axis perpendicular to said line;



spring means for biasing one of the members downwardly into said one member's use position when the other member is placed into said other member's use position; and

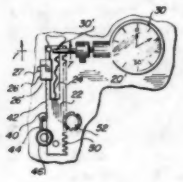
indicator means, carried by said upper portions and responsive to relative pivotal movement between said upper portions, for indicating the amount of said deviation.

4,638,567

KEY DECODING DEVICE FOR AUTOMOBILES

Garrett J. Leversee, 5669 W. 78th St., Los Angeles, Calif. 90045

Filed Jan. 6, 1986, Ser. No. 816,363
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—540 **6 Claims**



1. A key-decoding device for Mercedes Benz keys, and the like, for precisely measuring the depth of each cut of a key, the cuts defining a key code, comprising:

a measuring gauge having a projecting depth measuring tip for insertion into each of the cuts of the key to be measured for determining the depth of cut of each cut thereof in order to determine said key code;

slide carrier means for holding the key to be measured and for selectively positioning each cut of the key to be measured directly adjacent and in alignment with said projecting depth measuring tip on a cut-by-cut basis, so that said tip may enter into each cut for measuring the depth of the cut;

incrementing means for advancing said slide carrier means on an incremental basis so as to position the key to be measured in alignment with said tip for all of the depths of cut of the key that determine the unique and individual key code of the key;

positioning means for holding said slide carrier in each of the incremented positions by which a cut of the key to be measured is gauged by said tip;

housing means for mounting said slide carrier means for

reciprocal movement, said incrementing means and said positioning means;

said slide carrier means comprising an elongated, substantially-horizontal channel of substantially U-shaped cross-section in which is placed the key to be measured for movement along with said slide carrier means when said incrementing means moves said slide carrier means, so that said slide carrier means may position the key in alignment with said tip at each of incremented positions thereof, the depths of which are to be measured, said elongated channel having a depth less than the thickness of a key to be measured so that cuts of the key project above said elongated channel so that said measuring tip may measure the depths of the cuts of the key thereby;

said slide carrier means having an elongated side edge surface extending the length of said elongated channel and parallel thereto; said incrementing means comprising a rack-and-pinion arrangement, said rack being formed along said side edge surface of said slide carrier means, and said pinion being mounted on said housing means for cooperative engagement with said rack;

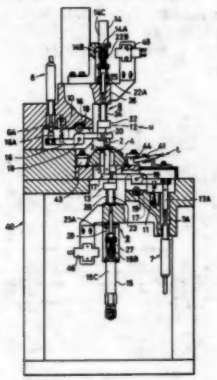
said measuring gauge tip being mounted for reciprocal movement in a direction transverse to the direction of movement of said slide carrier means.

4,638,568

METHOD AND APPARATUS FOR MEASURING WALL THICKNESS OF A WORKPIECE

Hiroo Umemura, Aichi, Japan, assignor to Taiho Kogyo Corporation, Ltd., Toyota, Japan

Filed Jan. 31, 1985, Ser. No. 696,811
Claims priority, application Japan, Jan. 31, 1984, 59-14328
Int. Cl.[4] G01B 7/06
U.S. Cl. 33—549 **20 Claims**



1. a device for measuring the wall thickness of a workpiece in the form of a half cylinder, comprising:

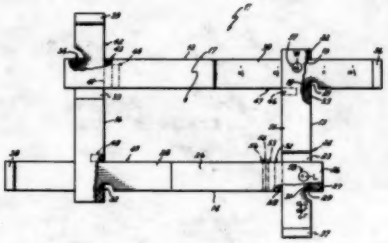
a measuring table; a block for supporting said workpiece above said measuring table insuch a manner that an inner surface of said workpiece is directed towards said measuring table and lower legs of said workpiece are spaced from said measuring table, said block having a supporting surface with a curved shape substantially similar in shape to said inner surface of said workpiece; an upper measuring unit for determining the position of an upper surface of said workpiece; a lower measuring unit for determing in the position of said inner surface of said workpiece; and means, responsive to the positions determined by said first and second measuring units, for determining the wall thickness of said workpiece.

4,638,569

BUSINESS FORM DESIGN AID

Thomas D. Dove, Cincinnati, Ohio, assignor to Bedinghaus Business Forms, Inc., Cincinnati, Ohio

Filed Apr. 22, 1985, Ser. No. 725,493
Int. Cl.[4] G01B 3/14
U.S. Cl. 33—562 **6 Claims**



1. A business form design aid comprising four elongated elements, each element having

two space-apart, opposite ends;

first and second outer, parallel segments; and

a middle segment disposed parallel to and between said first and second segments, said first, second and middle segments extending between said opposite ends;

said first and second segments each being discontinuous over a substantial portion of its length between a first point proximate one of said opposite ends of said element and a second point intermediate said opposite ends to expose a portion of said middle segment, said exposed portion being of a predetermined width;

said middle segment being interrupted proximate another of said opposite ends of said element through a longitudinal distance at least equal to said predetermined width to define a channel for slidably receiving an exposed portion of the middle segment of another said element;

said first, second and middle segments of all said elements being located in first, second and middle planes, respectively, with said middle planes disposed between said first and second planes;

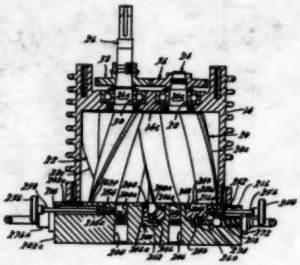
the exposed portion of the middle segment of each said element being slidably received in the channel of an adjacent element disposed perpendicular thereto to permit relative perpendicular sliding motion of the adjacent element along the exposed portion of the middle segment of the other element between said first and second points such that each element is movable in a first direction relative to one adjacent element and movable in a second, substantially perpendicular, direction relative to a second adjacent element, each element having an inner edge meeting the inner edges of the two adjacent elements substantially at right angles so that the inner edges of the four elements define an enclosed, generally rectangular area of variable size but with a minimum size defined between the inner edge and the midstream location of at least two adjacent elements, each element further including a business form design indicium spaced apart from the inner edge of one adjacent element, each element moving relative to said one adjacent element such that the business form indicium remains spaced apart from the inner edge of said one adjacent element by a constant amount.

4,638,570

SUPERCHARGER ASSEMBLY AND ROTOR PHASING FIXTURE AND METHOD OF PARTIALLY ASSEMBLING

Raymond A. Soeters, Jr., West Bloomfield Twonship, Oakland County, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 506,075, Jun. 20, 1983, abandoned.
This application Sep. 13, 1985, Ser. No. 775,556
Int. Cl.[4] G01B 5/14
U.S. Cl. 33—562 31 Claims



1. A machine operative to time meshed, lobed rotors of a partially assembled rotary blower, the blower during assembly and machine in combination comprising:

a housing section; first and second meshed, lobed rotors having first and second pairs of adjacent end faces at their opposite ends; first and second shaft portions respectively fixed to the first and second rotors and extending axially beyond the first pair of adjacent end faces; bearing assemblies carried by the housing section and supporting the shaft portions a predetermined transverse distance apart; a first timing gear fixed to one of said shaft portions; and a second timing gear adapted to be fixed to the other shaft portion and meshed with the first timing gear for establishing a fixed angular relation between the rotors; and

a base having first and second surfaces disposed in a common plane for supporting the second pair of adjacent end faces of the rotors thereon against rotation relative to their respective supporting surfaces about the shaft axes and with shaft axes spaced a predetermined distance apart, one of said surfaces defined by a member mounted for rotation relative to the other surface and about the axis of the associated rotor shaft to allow setting a predetermined clearance between the meshed lobes prior to fixing the second timing gear to the other shaft.

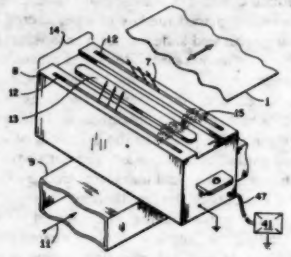
4,638,571

RADIO FREQUENCY NOZZLE BAR DRYER

William A. Cook, 2105 Swinnen Dr., Wilmington, Del. 19810

Filed Apr. 2, 1986, Ser. No. 847,208
Int. Cl.[4] F26B 3/34
U.S. Cl. 34—1 8 Claims

1. In a nozzle bar for treating a web with a gas, an electrically conductive structural housing comprising an internal gas distribution plenum connected to a source of treating gas and a perforate surface in proximity to the web for directing the gas flow from the bar upon the web; the improvement comprising at least one electrode insulatedly mounted on the perforate surface of the nozzle bar and a radio frequency power source electrically connected between the electrode and the nozzle bar housing whereby establishing a plurality of fringing radio frequency fields between said electrode and the structural housing; such fields substantially confined to the proximate space of the perforate surface and the web and intercepting the



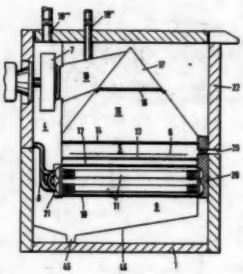
proximate web and transfering heating energy from the R.F. source to the web.

4,638,572

HEAT TREATMENT TUNNEL

Heinz Fleissner, Riehen, Switzerland, assignor to Vepa Aktiengesellschaft, Riehen/Basel, Switzerland

Division of Ser. No. 468,299, Feb. 22, 1983, Pat. No. 4,586,268.
This application Oct. 3, 1985, Ser. No. 783,532
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205962; Feb. 20, 1982, 3206158; May 4, 1982, 3216558; Jun. 23, 1982, 3223401
Int. Cl.[4] F26B 13/02
U.S. Cl. 34—41 15 Claims



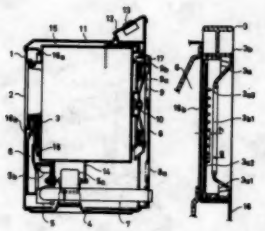
1. A heat treatment tunnel for the treatment of fibrillary material wherein the fibrillary material is transported along a travel path, in endless length form, through a horizontally arranged tunnel, said tunnel comprising a heat insulated housing having at the end faces thereof an inlet slot and an outlet slot, respectively, through which the fibrillary material moves along said travel path, a material feed slot arranged along one longitudinal side of said housing extending the entire length thereof, the material to be heated, being introduced through said feed slot over the length of the tunnel, during start-up of the heat treatment within said tunnel, a sealing means for preventing entry of atmosphereic air into said tunnel via said feed slot, said sealing means including a wall which, against resistance, yields briefly in the upward or downward direction and which, in its operative position, closes said slot.

4,638,573

LINT AND RAVELING COLLECTOR FOR CLOTHES DRYER

Shin Nakamura; Keiji Hikino, both of Hitachi; Shinichi Kaji, Katsuta, and Tsunetoshi Komatsu, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,771
Claims priority, application Japan, Nov. 9, 1984, 59-235126
Int. Cl.[4] F26B 11/04
U.S. Cl. 34—82 6 Claims



1. A lint and raveling collector for a clothes dryer in which clothing is housed and dried by heated air supplied to a rotating drum, a lint and raveling collector being installed in the side of the clothes dryer where the heated air is discharged from said rotating drum so as to collect the lint, raveling and similar fine waste coming out of the clothing, said lint and raveling collector comprising:

a lint and raveling filter having a net-like filter member for collecting lint, raveling and similar fine waste, and means including a plurality of ribs provided on the surface of said filter member for preventing the occurrence of any friction from direct contact between said net-like filter member and the clothing; and

a lint and raveling collecting box having an opening portion formed at a portion facing said ribs of said lint and raveling filter, said lint and raveling collecting box covering said lint and raveling filter in such a manner that a space for accumulation of the lint, raveling and similar fine waste is defined between said lint and raveling filter and an inner wall of the whole portion of said lint and raveling collecting box, except for the opening portion thereof.

4,638,574

REMOVABLE SHOE PROTECTOR

Dominick A. Roda, Meadville, Pa., assignor to Roda Industries, Inc., Meadville, Pa.

Continuation-in-part of Ser. No. 323,183, Nov. 20, 1981, abandoned. This application Aug. 19, 1985, Ser. No. 767,102
Int. Cl.[4] A43B 3/20, 13/22
U.S. Cl. 36—7.2 2 Claims

1. A shoe protector comprising,

a relatively flat half sole having a first part and a second part,

a toe protector made of thermoplastic material integrally molded to said first part of said half sole and adapted to extend rearwardly thereon,

said toe protector comprising a metallic toe protector member, of substantially the same shape and size as said toe protector, imbedded in said thermoplastic material of said toe protector,

said toe protector being adapted to receive the toe of a shoe, having a toe, a sole and a heel, with said half sole terminating adjacent said heel of said shoe,

a metallic bar imbedded in said half sole below said second part of said toe protector for reinforcing said half sole,

said part of said half sole adjacent said heel being relatively thin and extending outwardly and terminating in outwardly extending first and second wings integrally attached to said half sole,

said wings forming a continuation of the sides of said half sole and terminating in an edge approximately equal in length to the height of said toe of said toe protector,

a strap having a first end, a second end and an intermediate part between said first end and said second end,

said first end of said strap being fixed to the upper end of said first wing and said intermediate part extending rearwardly around the rear part of said shoe,

said second end of said strap attached to said second wing then extending forwardly through a loop attached to said toe protector and then rearwardly to said first wing,

a buckle on said first end of said strap,

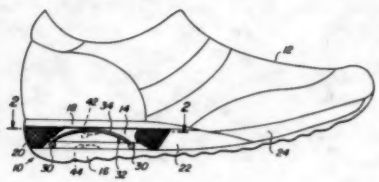
said second end of said strap being received in said buckle whereby said toe protector is supported on said shoe.

4,638,575

SPRING HEEL FOR SHOE AND THE LIKE

Vito J. Illustrato, 928 Peace St., Pelham Manor, N.Y. 10803

Filed Jan. 13, 1986, Ser. No. 818,377
Int. Cl.[4] A43B 21/30, 21/00
U.S. Cl. 36—38 3 Claims



1. A shoe incorporating a spring heel, comprising, in combination, a hollow chamber inside a heel of said shoe, a plurality of flexing leaf springs that bear between the inside bottom surface of the hollow chamber and a bottom surface of a sole of said shoe and is free to slidably move with respect to both said surfaces, the side walls of said chamber including flexible vent means for outside air to circulate into said chamber when said chamber alternately collapses and expands at each step by a person and weight application upon said heel, said leaf springs being upwardly curved and extending forwardly-rearwardly in said heel, and comprising wheel means at its distal end which roll in a track means contained within said chamber.

4,638,576

ATHLETIC SHOE WITH EXTERNAL COUNTER AND CUSHION ASSEMBLY

Rui M. Parracho, Peabody; Lloyd S. Smith, Newton Center; Richard P. Bunch, Reading, and Alexander L. Gross, Boston, all of Mass., assignors to Converse Inc., North Reading, Mass.

Filed Apr. 24, 1985, Ser. No. 726,508
Int. Cl.[4] A43B 7/14, 7/20
U.S. Cl. 36—68 10 Claims

1. An athletic shoe comprising:

an upper;

a sole, including a midsole and an outsole;

a substantially rigid exterior counter member having a perimeter flange portion and a wall portion, said flange portion extending along a lower edge of the wall portion and being attached to the midsole, and said wall portion including lateral and medial walls, said medial wall extending forwardly from the heel area on the medial side to approximately just behind the first metatarsal; and

a cushion member, having a floor and side wall portions, the cushion member fitting intermediate the external counter member and the upper with said side wall portions external to the upper, wherein the side wall portion of the cushion member includes a medial side wall that is approximately coextensive in length and height with the medial wall of the external counter, and forming with the external counter a counter and cushion assembly.

4,638,577

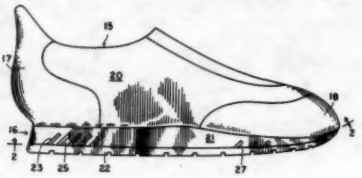
SHOE WITH ANGULAR SLOTTED MIDSOLE

Donnie E. Riggs, P.O. Box 2409, Carson City, Nev. 89702

Filed May 20, 1985, Ser. No. 736,099

Int. Cl.[4] A43B *13/04, 13/18*

U.S. Cl. 36—114 **13 Claims**



1. An athletic shoe comprising:

an upper portion forming a cavity to receive the wearer's foot and having heel and toe areas, and a lower portion to provide stability and cushioning to the wearer's foot, said lower portion comprising:

a midsole fixed to the upper portion and being formed at least in part of a first material,

a wear surface formed on the bottom of the midsole to contact the ground,

said midsole including a plurality of channels extending generally crosswise of the shoe and in the direction from shoe upper portion toward said wear surface to allow the midsole to compress and cushion the foot as the wearer's weight is exerted on said midsole and to form therebetween crossbeams to provide stability and transmit forces between the foot and the ground;

at least some of said channels in the midsole adjacent the heel area of said upper portion extending at one angle other than perpendicular to the wear surface and thereby being configured to absorb the shock of the shoe contacting the ground and at least some of said channels adjacent the toe area of the upper portion extending at a different angle from that of the channels adjacent the heel area and thereby being configured to provide rigidity to transfer force from the wearer's foot to the ground.

4,638,578

SKI BOOT

Harrison Eiteljorg, II, 541 E. Hector St., Conshohocken, Pa. 19428

Continuation-in-part of Ser. No. 450,764, Dec. 17, 1982, Pat. No. 4,510,703. This application Apr. 16, 1985, Ser. No. 723,865

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—119 **11 Claims**

1. A boot for supporting a user, comprising:

a sole block;

a first member forming a partial enclosure portion, fixed to the sole block and partially surrounding the user's foot at the toe, sides and back of the foot, the partial enclosure together with the sole block extending under and around the user's foot, and partially around a rear portion of the user's lower leg, the partial enclosure surrounding the foot and lower leg but for portions at a top of the foot and a front of the lower leg;

first belt means attached along edges of the sole block, the first belt means adapted to surround the user's foot at the instep, spaced forward from the user's ankle holding the foot block with respect to the sole block and exerting a downward pressure on the foot;

second belt means attached to the partial enclosure, the second belt means being spaced upwards from the sole block and surrounding the user's lower leg, the second belt means being adapted for fixing the user's lower leg to said partial enclosure, the second belt means exerting a rearward pressure on the lower leg; and,

a second member forming a cover, removably attachable to the partial enclosure over said top of the foot and said front of the lower leg.

4,638,579

POCKETED ATHLETIC SHOE

Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.

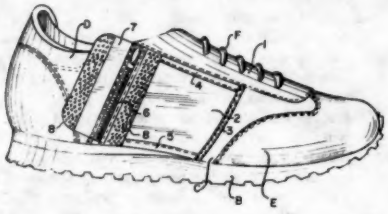
Continuation of Ser. No. 612,992, May 21, 1984, abandoned, which is a continuation of Ser. No. 314,134, Oct. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 231,251, Feb. 3, 1981, Pat. No. 4,384,414, which is a division of Ser. No. 107,092, Dec. 26, 1979, Pat. No. 4,296,559. This application Nov. 27, 1985, Ser. No. 802,935

Int. Cl.[4] A43B *23/00, 5/00*

U.S. Cl. 36—136 **4 Claims**

1. In a pocket for an athletic shoe and of the type incorporating a sole, quarter portions, counters, eyestay, and a vamp, all formed of flexible material, and securing together to form a structured athletic shoe, the quarter portions, counters, and vamp connecting with the shoe at its sole shank, and said shoe pocket designed to hold smaller sized personal items, such as keys, coins, or the like, as during jogging, comprising, said shoe having a quarter portion secured at the lower extent to

the sole shank, a pocket being formed securing with at least one of the shoe quarter portions and being of substantial size so as to overlie a substantial portion of the underlying shoe quarter portion, said pocket being secured at its lower part by being turned under with said quarter portion for securement with the sole at its shank, said pocket also having upper, front, and back edges, with said pocket edges being stitched to the contiguous quarter portion, said upper pocket edge being arranged adjacent the shoe eyestay, and being affixed in adjacency therewith, said front pocket edge being arranged proximate the shoe vamp, and said back pocket edge being arranged proximate the shoe counter, a slot being provided within said pocket to allow access into the pocket interior for the deposit of the aforesaid type of items therein, there being ends for the formed pocket slot, and one end of said slot terminating adjacent the lower



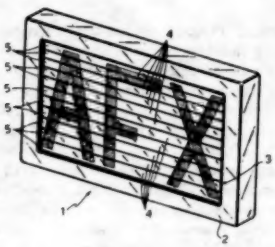
edge of the formed pocket, while the opposite end of the pocket slot terminating just proximate the upper edge of the formed pocket and in proximity with its connected eyestay, the disposed slot extending in adjacency upon the quarter portion overlying the shape of the foot of its wearer therein, and arranged just proximate the back edge of the formed pocket, zipper means provided upon the said shoe and within the region of and upon the opening of said pocket and disposed for providing closure for its formed slot, said pocket slot being disposed approximately in alignment with the said disposed back edge of the formed pocket, said zipper means being arranged aligned with the back edge of the formed pocket, and extending approximately from its eyestay to the sole shank of the athletic shoe, said zipper means being arranged aligned just slightly forwardly of the said rearward edge of the formed pocket.

4,638,580

PUBLICITY BOARD WITH ROTATING PRISMATIC MEMBERS

Anna Giannetti; Sergio Massa, both of Turin, and Cesare Re, Reano, all of Italy, assignors to S.r.l. LO.GI.CAM - Lombarda General Engeenering Costruzioni Automatiche, Italy

Filed Apr. 12, 1985, Ser. No. 722,817
Claims priority, application Italy, Apr. 20, 1984, 53291/84[U]
Int. Cl.⁴ G09F *11/02*
U.S. Cl. 40—503 **12 Claims**



1. A publicity board comprising:

a plurality of elongated prismatic members (4), each of said members (4) having a plurality of display faces (5), said members (4) mounted with their longitudinal axes in parallel, said members being adapted to rotate about their longitudinal axes to cause said display faces (5) to cyclically lie in a single plane;

motion generator means (7) for rotating said members (4) and having a drive shaft (12);

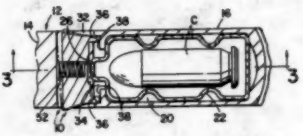
motion transmission means (10) coupled to said drive shaft (12), for transmitting rotating motion to said members (4), said motion transmission means (10) including an operating shaft (11), said operating shaft being coplanarly arranged with the longitudinal axes of said members and further including means (15, 27) carried by an end pivot (14) of each said prismatic member (4) for cooperating with said operating shaft (11) to cause periodic rotation of said prismatic members through an angle substantially equal to twice the angle formed at the center of said display faces (5) of said prismatic members (4), said shaft (11) arranged perpendicularly to the longitudinal axes of said prismatic members (4), said motion transmission means characterized in that said operating shaft (11) is modular and is constructed from a plurality of coaxially arranged substantially identical elements (17), said elements (17) being axially coupled together and angularly offset with a predetermined phase angle (S) between adjacent said element (17), whereby mechanical interference between said prismatic members (4) is prevented during the rotation of said members (4).

4,638,581

AMBIDEXTEROUS MAGAZINE CATCH

Wildey J. Moore, 610 Bloomingrove Tpk., New Windsor, N.Y. 12550

Filed Oct. 31, 1984, Ser. No. 666,201
Int. Cl.⁴ F41C *25/06*
U.S. Cl. 42—7 **8 Claims**



1. In a firearm having a frame defining a magazine well for receiving a magazine therein, and a magazine catch supported within an opening in the frame and moveable between a magazine retaining position wherein the magazine catch is engaged with an associated portion of a magazine contained within said well and a magazine releasing position wherein the magazine catch is out of engagement with the associated portion, the improvement wherein said magazine catch comprises a unitary member having supporting and restraining means integrally formed thereon for supporting said magazine catch on said frame to pivot within said opening about either one of its ends and to said magazine releasing position in response to force applied to the other one of its ends and restraining said magazine catch against substantial lateral movement relative to said frame, and means for biasing said magazine catch toward its magazine retaining position.

4,638,582

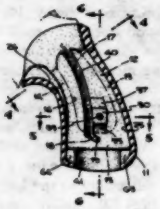
GRIP FOR HAND GUN

Frank W. Farrar, 11941 Paseo Bonita, Los Alamitos, Calif. 90720

Filed Aug. 6, 1985, Ser. No. 762,950
Int. Cl.⁴ F41C *23/00*
U.S. Cl. 42—71.01 **11 Claims**

1. A grip for a hand gun provided with a handle frame having an open mid-portion and a hammer spring, said grip comprising a substantially integral mass of yieldable elasto-

meric material having the form of a hand held grip on the exterior and having a pocket within the grip for reception of the handle frame, said pocket having a perimetrical wall adapted to extend around and into engagement with fore and aft and butt edges of said frame, said pocket having side walls intermediate the perimetrical wall adapted to enclose sides of



said frame, said grip having a passageway between the pocket and the exterior of the grip at an end of said pocket opposite from the butt edge, said end of said pocket being expandable in response to insertion and removal of said frame along an insertion axis between opposite ends of the pocket and being retractable into engagement with said frame for retention of said grip on said frame.

4,638,583

CONVEYER APPARATUS FOR FISHING LINE HAVING SNOODS ALONG ITS LENGTH

Kolbjörn Björshol, N-6560, Lanöyneset, Norway

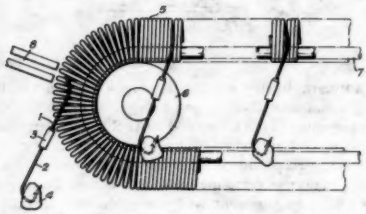
PCT No. PCT/NO84/00015, § 371 Date Nov. 23, 1984, § 102(e) Date Nov. 23, 1984, PCT Pub. No. WO84/03687, PCT Pub. Date Sep. 27, 1984

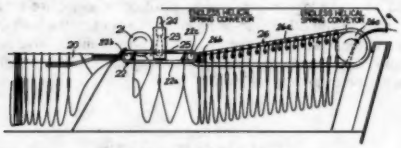
PCT Filed Mar. 20, 1984, Ser. No. 676,395

Claims priority, application Norway, Mar. 25, 1983, 831077

Int. Cl.[4] A01K *79/00*

U.S. Cl. 43—4 2 Claims





1. A delivery system for delivering a fishing line which has freely suspended snoods along its length from a first location to a second location, said delivery system comprising a first conveyor apparatus and a second conveyor apparatus,

said first conveyor apparatus comprising

first and second spaced apart turning rollers, said first turning roller being positioned at said first location and said second turning roller being positioned at an intermediate location between said first and second locations,

a first endless helical spring having tightly wound windings movably mounted around said first and second turning rollers, adjacent windings of said endless helical spring being partially separated as said endless helical spring passes around each of said first and second turning rollers, and

a feed element positioned adjacent said first turning roller to sequentially place individual snoods attached to said fishing line in the spacing between adjacent windings of said endless helical spring as it passes around said first turning roller, said individual snoods being released from between adjacent windings as said endless helical spring passes around said second turning roller,

said second conveyor apparatus comprising

third and fourth spaced apart turning rollers, said third turning roller being positioned at said intermediate location and said fourth turning roller being positioned at said second location, and

a second endless helical spring having tightly wound windings movably mounted around said third and fourth turning rollers, adjacent windings of said second endless helical spring being partially separated as said endless helical spring passes around each of said third and fourth turning rollers, said third turning roller being located relative to said second turning roller such that individual snoods attached to said fishing line which are released from adjacent windings of said first helical spring as it passes around said second turning roller will transfer into the spacing between adjacent windings of said second endless helical spring as it passes around said third turning roller.

4,638,584

LUMINESCENT FISHING LURES

William R. Lindsay, Rte. 10, Box 610, Arkanas Rd., West Monroe, La. 71291

Filed May 7, 1985, Ser. No. 731,548

Int. Cl.[4] A01K *85/01*

U.S. Cl. 43—17.6 4 Claims

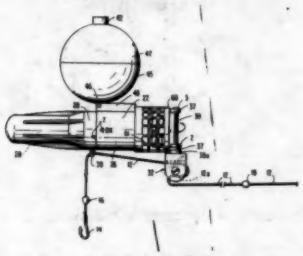
1. A luminescent fishing lure for attachment to a fishing line and attracting fish comprising a shaped lure body having a substantially opaque exterior surface and provided with a substantially transparent pattern in at least a portion of said surface; at least one mixing capsule provided in said body, said mixing capsule characterized by a flexible outer capsule and an inner capsule, said inner capsule having at least one first compartment for containing a first chemiluminescent compound, a second compartment for containing a second chemiluminescent compound and at least one frangible membrane separating said first compartment from said second compartment, whereby when said frangible membrane is ruptured, said first chemiluminescent component is mixed with said second chemiluminescent component to form said luminescent material; and eye means secured to said lure body for attaching said lure body to the fishing line.

4,638,585

MOTORIZED FISHING DEVICE AND METHOD

Gerald A. Korte, 14330 Regis St., Brookfield, Wis. 53005

Filed Mar. 13, 1985, Ser. No. 711,260
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—26.1 6 Claims



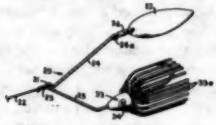
1. A fishing device comprising in combination,
a body,
means for propelling the body in the water,
means for mounting the body to an associated fishing line for movement relative to each other,
means including a catch for releasably fixing the body to the associated line to permit the body to feed out the line in the water upon propulsion of the body in the water, said means being releasable to permit the body and the associated line to move relative to each other while the body remains mounted on the line,
indicia means connected to the body for indicating the location of the body while in the water,
and wherein said catch is constructed such that when the line is released from the catch the line is movable relative to the body without interference from the catch,
and wherein said indicia means includes a float connected to the body,
and wherein said body has an upper portion including a mounting means and said float is attached to said mounting means such that the body extends longitudinally below the float.

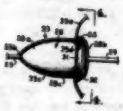
4,638,586

FISHING LURE

Joseph P. Hall, P.O. Box 505, Branson, Mo. 65616

Filed Jun. 9, 1986, Ser. No. 872,169
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.13 39 Claims





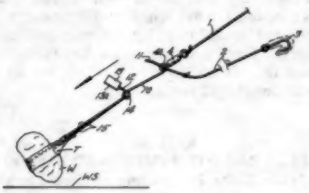
1. In a weight for a fishing lure, said weight comprising a substantially bullet (slug) shaped configuration in at least the leading portion thereof, with a substantially rounded, semiconical front end, a substantially cylindrical body portion and a rear end portion following said body portion, there being a hook lead wire received in part in said weight and fixed with respect to same, the following shank wire of the hook extending substantially axially rearwardly with respect to the longitudinal axis of said weight, said shank connected to the bend of the hook, at the end of which there is at least one barb, the improvement which comprises:
a resilient sleeve fitted over a substantial portion of the front end and body portion of said weight in expanded, tensioned manner,
the front part of said sleeve tapered forwardly in near conical manner, an intermediate portion of said sleeve being of substantially cylindrical form and the rear portion of said sleeve being slit to provide a multiplicity of elongate tendrils, strands or streamers said streamers having base portions at the junctures of said slit ends with said sleeve intermediate portion,
the intermediate portion of said sleeve just before said streamers being folded over upon itself on the said weight substantially cylindrical body portion
and means securing the two sleeve thicknesses in said folded over intermediate portion to one another and said weight body portion closely adjacent to the bases of said streamers,
whereby the streamers extend first forwardly, then outwardly and finally rearwardly around said hook shank, bend and barb, as well as the rear weight portion.

4,638,587

DISPOSABLE CASTING AID

Alexander W. Koch, P.O. Box 847, Winchester, Oreg. 97495

Continuation-in-part of Ser. No. 718,536, Apr. 1, 1985, abandoned. This application May 13, 1985, Ser. No. 733,601
Int. Cl.[4] A01K *91/02*
U.S. Cl. 43—43.12 7 Claims



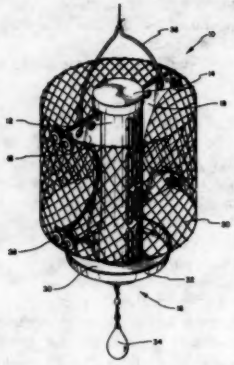
1. A disposable casting aid for temporary attachment to and automatic release from a fishing line, said aid comprising,
an elongate main body member having a hook-shaped arm at one end for releasable hook engagement with the fishing line,
a buoyant member of low density material located at the other end of said elongate main body member,
and a casting weight attached to said main body member at a point intermediate the ends thereof,
said point of attachment of said casting weight constituting a fulcrum about which said buoyant member may act to rotate said body member in the water,
said buoyant member upon being submerged rotating said main body member and said arm thereon to disengage said hook-shaped arm and thus the casting aid from the fishing line.

4,638,588

FISH ATTRACTING DEVICE

Carole R. Abadie, 3505 Bellah Ct., Irving, Tex. 75062

Filed Jan. 7, 1985, Ser. No. 689,136
Int. Cl.[4] A01K 69/06
U.S. Cl. 43—44.99 14 Claims



1. Apparatus for attracting fish, comprising:

(a) A hollow container for retaining fish bait therein, said container having first and second open ends and at least one aperture therein for permitting fish bait to exit said container;

(b) A first closure member for attachment to said first end of said container for closing said first end;

(c) A second closure member for attachment to said second end of said container for closing said second end;

(d) A solid tray member mounted with said second end of said container for collecting fish bait that exits said container; and

(e) a single cylindrically shaped open ended mesh screen mounted substantially concentrically about said container by diametrically opposed support structures extending radially from, and formed integrally with, said container, spacing said screen from said container whereby smaller fish may freely swim through said screen, as well as around the screen through said open ends, and may freely feed on accesible fish bait within said container and on fish bait collected in said tray, but wherein said screen prevents larger fish from feeding on fish bait within said container, fish bait collected in said tray, and smaller fish within the interior of said screen.

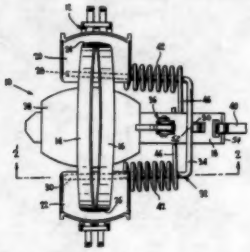
4,638,589

ANIMAL TRAP WITH IMPROVED SECURITY

William E. Askins, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed Jul. 22, 1985, Ser. No. 757,803
Int. Cl.[4] A01M 23/26
U.S. Cl. 43—88 2 Claims

1. In an animal trap of the type including a pair of pivotal jaws, and spring loaded actuators for moving the jaws from open to closed position, the actuators each embracing the respective arms of a U-shaped retention pin, the arms of the retention pin further carrying springs for the respective actuators, and the retention pin having a base portion connecting the arms of the pins which base portion extends across a frame member of the trap between a bait pan attachment and a dog mounting end of the frame member, the improvement comprising means for preventing an animal caught in the trap from withdrawing the arms of the pin from the actuators and thereby dismantling the trap, said means comprising a lance upset from the frame member between the base portion of the pin and the dog mounting end of the frame member, the lance having a free end positioned for engagement by an outer surface of the base portion of the pin precluding axial movement



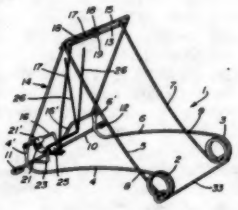
of the pin arms in a direction withdrawing same from the actuators.

4,638,590

HUMANE ANIMAL TRAP

Wilfrid Desrosiers, 6 Cournoyer Street, Kapuskasing, Ontario, Canada (P5N 2N1), and Gaston Labelle, 58 Government Road, Kapuskasing, Ontario, Canada (P5N 1X2)

Filed Sep. 10, 1985, Ser. No. 774,476
Int. Cl.[4] A01M 23/26
U.S. Cl. 43—88 6 Claims



1. An animal trap comprising two pairs of spaced-apart and parallel first and second arms made of a resilient material and having forward and rearward ends, both arms of each of said pairs being integrally formed at their rearward ends with a coil spring portion; the latter biasing the two arms of each pair towards each other; each first arm having an upturned forward end potion and adapted to contact with the ground on which the trap is placed; a transverse abutment member joining each said upturned forward end portion; a rigid transverse striking bar being adapted to be set in vertically-spaced relation to the transverse abutment member against the biasing force of the two coiled spring portions; setting means to set said striking bar in said vertically-spaced relation and comprising: a frame-like setting member having an inner part pivoted to each said upturned forward end potion and having an outer transverse retaining segment which extends above said striking bar in the set position of the latter; release means to release said striking bar, said release means including a hook means pivotally mounted on said outer retaining segment and releasably engaging said striking bar, and trigger means actuatable by an animal to release said hook means; wherein said hook means includes a hook and a release rod to pivot said hook, said release rods extending downwardly from said outer retaining segment when in said set position; said trigger means including a tripping plate having an inner end pivotally secured to said transverse abutment member and an outer end portion formed with a slot adapted to releasably retain the lower end portion of said release rod; depression of said tripping plate releasing said release rod.

4,638,591

FISH SECURING DEVICE

David B. Neumann, P. O. Box 3194, Manhattan Beach, Calif. 90266, and Robert D. Hunt, 4166 137th St., Hawthorne, Calif. 90250

Filed Feb. 10, 1986, Ser. No. 827,458
Int. Cl.[4] A01K *83/04*
U.S. Cl. 43—89 11 Claims

1. A fish securing device comprising:
an axial guide member having a proximal end and a distal end;
a fish hook carrier axially slideable on said axial guide at said distal end thereof ;
a plunger slideable along said axial guide member;
a plurality of spear arms hingedly mounted to said axial guide intermediate said plunger and said fish hook carrier;
actuating means connected between said spear arms and said plunger for simultaneously pivoting said spear arms between an open cocked position and a closed fish engaging position responsive to axial movement of said plunger;
spring means between said plunger and axial guide for urging said spear arms towards their fish engaging closed position ,
over-the-center locking hinge means operatively connecting between said carrier and said axial guide;
said locking hinge means being engageable for supporting said spear arms in said open position against said spring urging, said locking hinges releasing said spear arms for movement towards their fish engaging closed position in response to distally directed axial tugging force on said carrier .

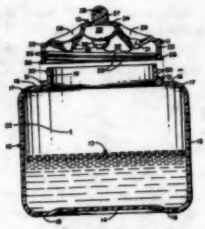
4,638,592

FLY TRAP AND ATTRACTANT THEREFORE

Rodney G. Schneidmiller, E. 8604 S. Riverway, Spokane, Wash. 99206

Filed Oct. 21, 1985, Ser. No. 789,850
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—122 7 Claims

1. A containment type fly trap comprising in combination:
a peripherally defined body having a neck in its upper portion with means to releasably interconnect a top, said body defining an entrapment chamber and being translucent to light and heat waves and
a top having a lower cylindrical portion configured to fit about and releasably interconnect with the body neck and an upwardly convex top element defining
a plurality of spacedly arrayed concave entryway dimples, each carrying in the medial portion thereof a downwardly extending entryway tube, each said entryway tube defining an entryway channel to allow downward entry of flies therethrough to the entrapment chamber and means to aid in preventing flies' upward



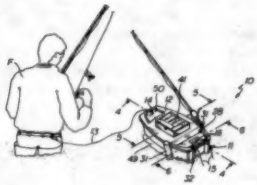
exit from the entrapment chamber through the entryway channels.

4,638,593

FLOATING FISHING ACCESSORY

Robert L. Garcia, 226 Stiles, Houston, Tex. 77011

Filed May 6, 1985, Ser. No. 730,555
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—54.1 10 Claims



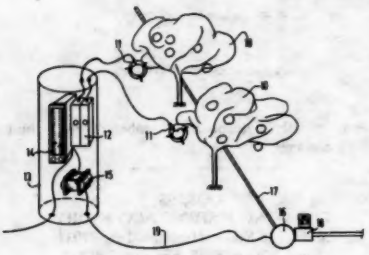
1. A floating fishing accessory comprising
a unitary generally enclosed bouyant hull having front and rear walls, spaced side walls, and top and bottom walls defining a storage space therein,
said storage space divided into a first compartment for receiving and containing live bait and a second adjoining compartment for storing various articles,
said first compartment having an apertured closure member pivotally mounted in said top wall providing access thereto and a plurality of apertures through said hull positioned at the general location of the surface of the water in the floating position whereby both fresh water and air circulate therethrough as said hull moves in the water due to wave action for maintaining the bait in a live condition for an extended period of time,
said second compartment provided with a closure member pivotally mounted in said top wall providing access thereto and an interior lining of thermally insulating material suitable for selectively storing articles in a thermally insulated condition or other articles in a relatively dry condition,
at least one generally rectangular fin depending from said bottom wall of said hull and extending longitudinally a distance therealong for stabilizing said hull in a balanced position in the water and supporting said accessory in a horizontal position out of the water on a ground surface,
bouyancy means on said hull for maintaining said hull in a balanced floating position in the water when loaded with heavy articles,
tubular rod holding means on the exterior of said hull adapted to receive and hold fishing rods, and
attaching means on said hull for releasably attaching said accessory to the user to float at a convenient distance therefrom.

4,638,594

PROCESS AND APPARATUS FOR AUTOMATICALLY CONTROLLING THE IRRIGATION OF PLANTS

Jean-Gérard Huguet, Le Pontet, and Bernard Jaussely, Montfavet, both of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Feb. 5, 1985, Ser. No. 698,590
Claims priority, application France, Feb. 9, 1984, 84 02020
Int. Cl.[4] A01G *25/16*
U.S. Cl. 47—1 R 22 Claims



1. A process for irrigating plant crops which comprises the following steps:

(a) measuring daily variations in diameter of a specific part of a plant that reflects water requirements and resources of the plant as a whole,

(b) determining a maximum daily decrease in the diameter, corresponding to lack of any need for irrigation, climatic influences being taken into account,

(c) fixing a threshold valve for the decrease so that, when said decrease exceeds the threshold value, a deficiency of irrigation is presumed,

(d) comparing each measured decrease with said threshold value and forming a control signal when the threshold value is exceeded,

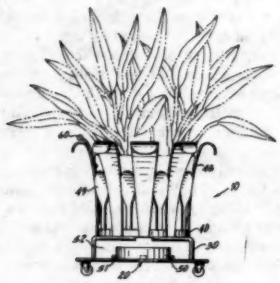
(e) triggering irrigation and delivering a predetermined quantity of water when the control signal is formed.

4,638,595

PLANT TRANSPORTING DEVICE

Mauricio Rivero, 3411 SW. 16 Ter., Miami, Fla. 33145

Continuation-in-part of Ser. No. 453,580, Aug. 11, 1983, abandoned. This application Mar. 5, 1985, Ser. No. 708,540
Int. Cl.[4] A47G *7/00*
U.S. Cl. 47—39 4 Claims



1. A device for transporting plants in their pots, comprising:

A. a wheeled frame;

B. support bracket means mounted on said frame;

C. a base member mounted on said support bracket means in a spaced apart relationship with respect to said frame thereby forming a compartment and said base member further including a drainage hole;

D. a plurality of upwardly extending first rigid members attached to the periphery of said base member, said rigid members biased inwardly providing a flexible enclosure to keep said pots in place during transportation;

E. reservoir means positioned within said compartment so that it may collect the excess water dripping from said drainage hole;

F. a plurality of upwardly extending second rigid members alternatively arranged between said first rigid members being smaller size, and said first and second rigid members being mechanically connected between adjoining members so that further structural integrity is provided insuring the availability of said sufficient tension; and

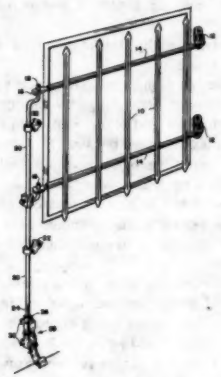
G. telescopic handle means for pulling said device, said handle means being concealed within said device and having a plurality of tubular members that can be housed within each other so that said handle means may be concealed.

4,638,596

SAFETY LOCK FOR SECURITY WINDOW GRATINGS

Mike Gallardo, 16829 E. 14th St., San Leandro, Calif. 94578

Filed Sep. 9, 1985, Ser. No. 773,935
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—56 2 Claims



1. A security grating system for securing a window of a building against outside intrustion including:

a window covering grating having first and second side ends, said grating being hinged on a first side end thereof to the building wall, said grating having locking means on the second side end thereof for locking engagement with a vertical rod;

a substantially vertical locking rod slideably positioned adjacent the second side end of said grating, in a raised position said locking rod being in locking engagement with said grating locking means, in a lowered position said locking rod being released from locking engagement with said grating locking means, said locking rod vertically extending from said grating locking means to a point near the floor level of said building and having a horizontal groove in a side surface of said rod at a position above said point;

a tubular member attached to said building and slideably engaging a lower portion of said locking rod; and

a lever bar having first and second ends, said second end supporting a pedal, the first end of said lever bar being horizontally bent to engage the horizontal groove in the

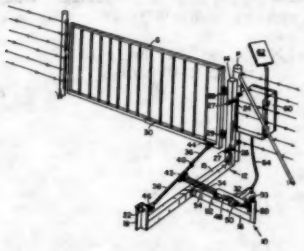
side surface of said locking rod, said lever bar being pivotally coupled near its center to said tubular member, said lever bar being spring biased into locking engagement in the groove in said locking rod when said locking rod is in locking engagement with said grating locking means.

4,638,597

MODULAR AUTOMATIC GATE OPENER

Robert W. Lybecker, San Antonio, Tex., assignor to Bomar Corporation, Inc., San Antonio, Tex.

Filed Mar. 21, 1986, Ser. No. 842,560
Int. Cl.[4] E05F *15/02*
U.S. Cl. 49—340 **11 Claims**



1. An automatic gate opening apparatus, comprising:

a frame assembly comprising a vertical portion, said vertical portion of said frame assembly comprising a shaft having a generally square cross-section and a plurality of axially aligned apertures in opposing faces of said shaft, a horizontal portion, and a gate-receiving means hingedly secured to said vertical portion, said vertical and horizontal portions being attached in a predetermined fixed relationship, said horizontal portion comprising first and second mounting means;

a linkage assembly hinged secured on one end to said first mounted means and hingedly secured on the other end to said gate-receiving means;

actuator means hingedly secured on one end to said second mounted means said actuator comprising an extendible shaft having one end received in said actuator and having the other end attached to said linkage assembly;

control means connected to said actuator means for operating said actuator; and

sensor means for signaling said control means to activate said actuator means, thereby causing said sahft of said actuator means to move said gate-receiving bracket between said open and said closed position.

4,638,598

FORCE HINGE CONNECTION FOR THE LATCHING MECHANISM OF A PANEL TRUCK OR VAN WINDOW

Peter N. Gold, 465 North Wood Rd., Rockville Centre, N.Y. 11570

Filed May 2, 1986, Ser. No. 858,711
Int. Cl.[4] E05B *65/06*
U.S. Cl. 49—394 **4 Claims**

1. A casement window for a panel truck, van or the like having a window pane hung along one edge of a window frame by a flexure mechanism arranged to permit pivotal movment of said window pane about an axis oriented along the corresponding edge of the window frame, an over centered handle latch mounted on said window frame and being operable to move said window pane between an open and closed position, and a resilient hinge connecting said latch directly to said window pane so as to enable said latch and pane to have relative elastic movement in both the closed and open condition, said resilient hinge comprising a serpentine band having a pair of interconnected U-shaped sections, one of which being adapted to envelop and be adhesively secured along the edge

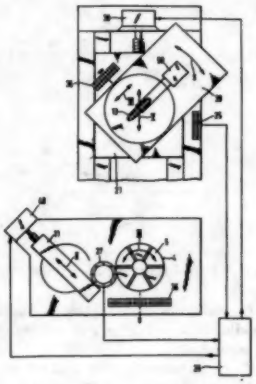
of said window pane, the other of which comprises a compressible spring the free end of which is secured to said latch.

4,638,599

GEAR GRINDING MACHINE FOR RADIAL OR HELICAL SPUR GEARS

Kurt Maier, Langestrasse 112, D-7500 Karlsruhe 51, Fed. Rep. of Germany

PCT No. PCT/DE84/00130, § 371 Date Dec. 28, 1984, § 102(e) Date Dec. 28, 1984, PCT Pub. No. WO84/04894, PCT Pub. Date Dec. 20, 1984
PCT Filed Jun. 8, 1984, Ser. No. 684,591
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320914
Int. Cl.[4] B24B *3/00*
U.S. Cl. 51—52 R **4 Claims**



1. A rolling type gear grinding machine for grinding radially or helically toothed spur gears including a rolling mechanism having a translational and a rotational component for an involute tooth gear of the type including;

a machine stand having a plurality of guides mounted thereon;

a main slide mounted on at least two of said guides for reciprocating movement of said main slide along an axis on said stand, said main slide having at least two guides mounted thereon, said main slide providing said translational component;

an auxiliary slide mounted on said two guides on said main slide for reciprocating movement of said auxiliary slide along an axis which is at an angle to the axis of movement of said main slide;

means cooperating with said auxiliary slide for producing said rotational component, said means including a sliding

element in a guide slot, said element capable of reciprocating movement in said guide slot, said guide slot being adjustable about an axis of rotation;

a belt drive cooperating with said auxiliary slide;

a workpiece table on said main slide;

an arcuate rolling member mounted on said workpiece table and drivably connected to said auxiliary slide via said belt drive, said workpiece table being rotated by said arcuate rolling member;

the improvement comprising in combination:

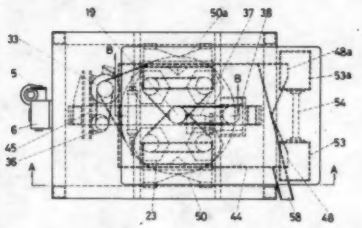
said grinding machine further includes a vertically adjustable slide on said machine stand and a tool slide mounted on said vertically adjustable slide, said auxiliary guide being drivable according to the position of said main slide to the helix angle and other data pertinent to a gear to be ground, such that when said guide slot is adjusted and locked in a position parallel to said axis of movement of said auxiliary slide, said machine operates as a form grinding machine and, when said guide slot is rotated to a posotion which is at an angle relative to the axis of movement of said auxiliary slide, said grinding machine operates as a generation grinding machine.

4,638,600

MULTI-FUNCTION WORK FINISHING MACHINE USING BARREL CONTAINERS

Hisamine Kobayashi, and Katsuhiro Izuhara, both of Nagoya, Japan, assignors to Lipton Manufacturing Corporation, Nagoya, Japan

Filed Mar. 28, 1985, Ser. No. 717,293
Claims priority, application Japan, Oct. 16, 1984, 59-217143
Int. Cl.[4] B24B *31/02*
U.S. Cl. 51—164.2 **9 Claims**



1. A multi-function barrel finishing apparatus comprising:

a machine pedestal;

a main spindle pivotably mounted on said machine pedestal, said main spindle having a central axis and being rotatable about said central axis;

first and second rollers rotatably mounted on said machine pedestal, said first and second rollers being connected by a first shaft;

third and fourth rollers rotatably mounted on said machine pedestal, said third and fourth rollers being connected by a second shaft which is parallel to said first shaft;

a first rolling plate rotatably supported by said first and third rollers;

a second rolling plate rotatably supported by said second and fourth rollers, said second rolling plate being parallel to said first rolling plate;

a pair of parallel lateral plates extending between said first and second rolling plates, said lateral plates rotatably supporting said main spindle;

means for rotating at least one of said rollers to thereby pivot said main spindle to any one of a plurality of desired angular positions with respect to said machine pedestal;

a turret rotatably supported by said main spindle;

a plurality of barrels rotatably mounted on said turret, said barrels being rotatable about barrel axes which are offset from said central axis, each of said barrels having an equilateral polygonal cross-section;

barrel rotation means for rotating said barrels about said barrel axes;

turret rotation means for rotating said turret about said central axis, said turret rotation means being operable independently from said barrel rotation means; and

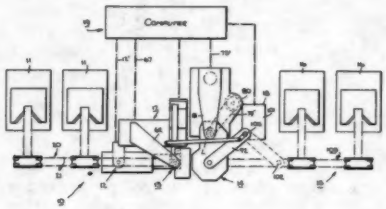
means for and holding said main spindle at any one of a plurality of desired angular positions with respect to said machine pedestal.

4,638,601

AUTOMATIC EDGE GRINDER

Robert Steere, Boonton, and Thomas Lewandowski, Wanaque, both of N.J., assignors to Silicon Technology Corporation, Oakland, N.J.

Filed Nov. 4, 1985, Ser. No. 794,629
Int. Cl.[4] B24B *9/10*
U.S. Cl. 51—165.71 **31 Claims**



1. An automatic edge grinder comprising

at least one wafer unloading station for delivering a series of wafers;

a thickness measuring station for sequentially receiving the series of wafers, said measuring station having means for measuring the thickness of a delivered wafer;

a centering station having means for centering a wafer therein and probe means for aligning a centered wafer relative to a longitudinal axis;

a grinding station having means for grinding an edge of a received wafer;

a first transfer mechanism for moving a centered and aligned wafer from said centering station in parallel to said axis to said grinding station;

at least one loading station for receiving a series of edge-ground wafers; and

a second transfer mechanism for moving an edgeground wafer from said grinding station to said loading station.

4,638,602

TURBINE BLADE HOLDING DEVICE

Dominic A. Cavalieri, P.O. Box 248, Hibernia Rd., Salt Point, N.Y. 12578

Continuation-in-part of Ser. No. 815,945, Jan. 3, 1986, abandoned. This application Mar. 12, 1986, Ser. No. 838,943
Int. Cl.[4] B24B *41/06*
U.S. Cl. 51—217 R **18 Claims**

1. Apparatus for securely holding a turbine blade during grinding of the root form portion thereof, comprising

(a) a fixed base;

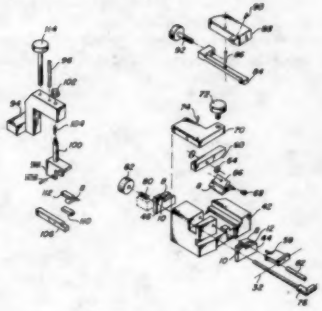
(b) a first datum plate connected with said base adjacent the front portion thereof for supporting the leading and trailing edges of a first section of the turbine blade;

(c) a second datum plate connected with said base adjacent the rear portion thereof for supporting the leading edge of a second section of the turbine blade;

(d) a longitudinally extending pin connected with said base and adapted to abut against the datum point of the blade; and

(e) means for clamping the blade against said first and second datum plates and said pin, said clamping means including

(1) a clamping device pivotally connected with said base and arranged along the fulcrum of the blade; and



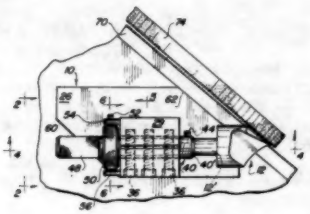
(2) means for displacing said clamping device against the upper surface of the blade.

4,638,603

DEVICE FOR SHARPENING SINGLE-FLUTE COUNTERSINKS

Harvey E. Hanson, 8770 Van Nuys Blvd., #6, Panorama City, Calif. 91402, and John A. Amaniera, 13939 Wallabi Ave., Sylmar, Calif. 91342

Filed Jan. 29, 1986, Ser. No. 823,803
Int. Cl.[4] B24B 3/24
U.S. Cl. 51—219 R **3 Claims**



1. A device for sharpening a single-flute countersink comprising:

a mounting plate;

an upstanding post mounted on said mounting plate and having an enlarged opening formed therethrough at an upper portion thereof;

a threaded countersink mounting means for mounting in said enlarged opening having means at one end thereof for securing thereto a shaft of a single flute countersink;

means operatively associated with said threaded mounting means for limiting the rotation of said threaded mounting means to considerably less than 360 degrees in said enlarged opening;

a grinding machine having a work-table for supporting thereon said upstanding post, a guide rail, and a surface grinding wheel rotatable in a vertical plane, said grinding wheel having a front grinding surface face contained in a vertical plane against which a single-flute countersink is sharpened;

means for orienting said threaded mounting means at a desired angular position relative to said front face of said grinding wheel, said means for orienting comprising a first canted side edge surface of said mounting plate, and a second canted side edge surface of said mounting plate, said first and second side edge surfaces being diametrically opposite each other, so that each of said side edge surfaces may be used to position said mounting plate at a desired angle relative to said front face of said grinding wheel, said first side edge surface having a different angle of cut than said second side edge surface to accomodate two different types of single-flute countersinks, one of said first and second canted side edge surfaces being in abutting contact with said guide rail of said grinding machine;

means for manually rotating said threaded mounting means in said enlarged opening at the other end thereof; said one end of said threaded mounting means lying on the opposite side of said upstanding post as compared with said other end of said threaded mounting means;

said mounting plate and said upstanding post mounting thereon being positioned on said work table in front of said front face of said surface grinding wheel, said threaded countersink mounting means comprising a shaft having a hollow end, said shaft lying entirely in front of said front face and at an angle with respect thereto of one of the angles of one of said first and second canted side edge surfaces such that the longitudinal axis of said shaft intersects said front face at said one angle;

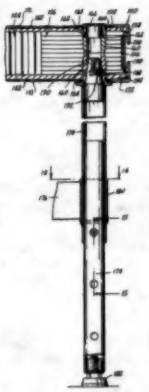
said means limiting the rotation comprising a collar member rotatable with said shaft at the end thereof remote from said hollow end, said collar member comprising a circumferentially projecting pin, said upstanding post having a side surface facing toward said collar and having a pair of angularly spaced-apart projecting stop members projecting away from said grinding wheel for limiting the rotation of said collar and said shaft by the cooperation of said pin member with said pair of stop members, said collar having an inner threaded opening for receiving therethrough said end of said shaft remote from said hollow end, whereby said collar may be adjusted along the length of said shaft.

4,638,604

STAGING STRUCTURE

O. David Rogers, Farwell; John Bardwick, III, Tipton, and Kenneth Staten, Clare, all of Mich., assignors to Stage Rite Corporation, Farwell, Mich.

Filed May 7, 1984, Ser. No. 607,978
Int. Cl.[4] E04H 3/10
U.S. Cl. 52—6 **7 Claims**



1. A staging system for construction of flat stages, choral risers and the like which comprises:

(a) a flat structural load-bearing square, rectangular or trape-

zoidal panel to serve as a module having spaced upper and lower surfaces,

(b) an edge piece secured to one or more edges of said panel having an external re-entrant groove parallel to said panel surfaces,

(c) said panel having, at each corner, recessed sockets on a common axis and opening respectively to the upper and lower surfaces of said panel,

(d) railing supporting stanchions recessed into sockets opening to the top surface of a module to support railings along an edge of staging assemblies,

(e) said supporting stanchions having a retractable threaded shaft at the lower end,

(f) means to bias said shafts to a retracted position, and

(g) means including a cross-pin and bayonet slot to lock said shafts in extended position for assembly.

4,638,605

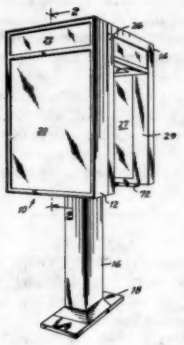
MOUNTING MECHANISM FOR CONNECTING LIGHT BOX TO TELEPHONE ENCLOSURE

Frank Rosa, Brooklyn, N.Y., assignor to Redyref-Pressed & Welded, Inc., Long Island City, N.Y.

Filed Feb. 14, 1985, Ser. No. 701,392

Int. Cl.[4] E04F *19/00*

U.S. Cl. 52—28 **7 Claims**



1. A device for connecting a light box having a rear wall and a bottom wall to a telephone enclosure having a side wall with an opening therein and a lower edge, said device comprising a first bracket secured to said rear wall and having a projection adapted for mating engagement with said opening, and a second bracket secured to said bottom wall and having a channel adapted to engage said lower edge.

4,638,606

DECORATIVE TRIM SYSTEM FOR PARTITION ADAPTED TO SUPPORT A CANTILEVERED LOAD

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 551,424, Nov. 14, 1983, Pat. No. 4,570,390. This application Sep. 9, 1985, Ser. No. 773,785

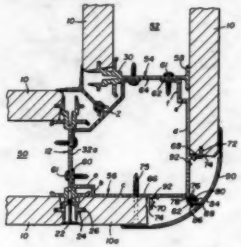
Int. Cl.[4] E04B *1/56*

U.S. Cl. 52—36 **12 Claims**

1. A system for forming an outside corner of a kerfed-edge wallboard partition adapted to support a contilevered load, and for mounting decorative trim at said corner, said system comprising:

a stud having a web which comprises a plate portion and a bifurcated channel housing for a two-tiered longitudinal channel, the first tier being proximate to the plate and having confronting threaded or threadable facets so that the channel may accept a screw at any level, the second tier being open to the frontal insertion of a slotted standard, said stud also having a kerf-engaging flange extending laterally from the housing of the second tier; and

a corner stud having a first flange fastened to the plate of the bifurcated stud, a web having a first segment extending at a right angle from said flange, a second segment extending at a right angle from the first segment in opposition to said flange, a third segment offset from but in a plane parallel to the first segment, a fourth segment extending at a right angle from the third segment and through the plane of the



first segment, a fifth segment at a right angle to the fourth segment and extending toward the plane of the second segment, a sixth segment at a right angle to the fifth segment and extending away from the plane of the third segment, a second flange extending at a right angle from the sixth segment toward the plane of the first flange, and a channel housing opening outwardly from the juncture of the third and fourth segments and diagonally disposed with respect to said segments; and

means for fastening wallboard to the corner stud.

4,638,607

BOX-UNIT AND MOLDING APPARATUS FOR ITS PRODUCTION

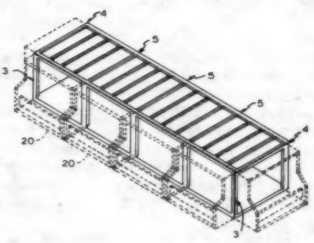
Anatoli M. Hadjiiski; Hristo P. Varbanov; Michail T. Mishonov; Vladimir P. Stamov; Rosen P. Savov; Strahil K. Radenkov; Vladimir B. Panev, and Alexander S. Velev, all of Sofia, Bulgaria, assignors to Issledovatelski Centar "Tekom", Sofia, Bulgaria

Filed May 17, 1985, Ser. No. 735,432

Claims priority, application Bulgaria, May 17, 1984, 65533; Jun. 28, 1984, 66037

Int. Cl.[4] E04B *1/348*

U.S. Cl. 52—79.9 **4 Claims**



1. In a box-unit including a floor and ceiling slab and a spatially reinforced concrete framework made of two longitudinal frames and a number of transverse frames composed of the relevant cross bars and columns; the said transverse frames being two at the ends and at least one in the middle, the improvement wherein the cross bars of the longitudinal frames have a reinforced cross section asymmetrical as regards the cross section of the columns and an uninterrupted and equal

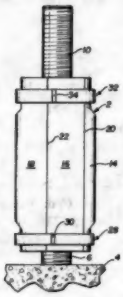
reinforcement of upper and lower cross bars which has a closed shape incorporating the cross bars of the longitudinal frames and the columns of the end transverse frames, and at a modular distance from each other in the cross bars of the longitudinal frames there are provided critical zones with double cross sections with regard to the cross bars and the columns of the end transverse frames to connect in them the reinforcement of the cross bars and the columns respectively of the middle transverse frames and each of the columns, and each of the cross bars of the middle transverse frames has a variable cross section ranging from a single to double cross section.

4,638,608

BREAKAWAY STANDARD SUPPORT ASSEMBLY

William H. Coy, Lancaster, Pa., assignor to Precisionform, Inc., Lancaster, Pa.

Filed Oct. 7, 1985, Ser. No. 784,931
Int. Cl.⁴ E04C *1/00*
U.S. Cl. 52—98 **21 Claims**



1. A breakaway standard support assembly comprising
a base member,
a standard member,
a coupler securing said base member to said standard member,
said coupler having a plurality of body elements and strap means securing said body elements in a coupler body assembly,
said coupler body assembly having a generally axial bore,
said strap means being frangible for fracture upon application of a predetermined generally horizontal impact load to said assembly,
said strap means surrounding and securing said body elements in said coupler body assembly,
base anchor means extending into one end of said coupler body assembly bore, and
standard anchor means extending into the other end of said coupler bore assembly bore, whereby said coupler will support the static load of said standard and normal wind loads but will become disassembled upon application of a predetermined generally horizontal impact load adequate to fracture said strap means.

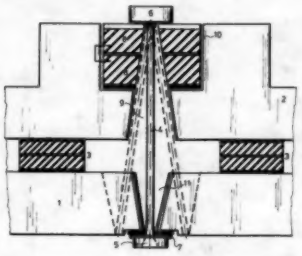
4,638,609

SYSTEM FOR REDUCING THE SEISMIC LOAD OF TALL BUILDINGS

Béla Csák, Budapest, Hungary, assignor to Budapest Muszaki Egyetem, Budapest, Hungary

Filed Jun. 22, 1984, Ser. No. 623,715
Claims priority, application Hungary, Jun. 7, 1984, 2202/84
Int. Cl.⁴ E02D *27/34*
U.S. Cl. 52—167 **2 Claims**

1. In a system for reducing the seismic loads of tall buildings having a foundation and a superstructure with high centre of gravity and to prevent the tipping over of buildings, the improvement comprising elastic elements provided between the foundation and the superstructure, vertical cavities (9,11) having a predetermined diameter formed in the foundation (1) and in the superstructure (2), means for mounting cables (4) in said



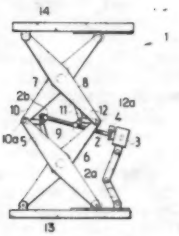
cavities between the foundation (1) and the superstructure (2), both ends of said cables being provided with lower and upper head pieces (5,6) wider than the diameter of the cavities (9,11), and elastic padding means installed in the upper head piece (6), wherein the diameter of the cavities (11) in the foundation (1) is increasing upwards.

4,638,610

THEATRICAL STAGE

Urho Heikkinen, Helsinki 40, Finland, assignor to Elevator GmbH, Baar, Switzerland

Continuation of Ser. No. 471,833, Mar. 3, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 778,761
Int. Cl.⁴ E04H *12/18*
U.S. Cl. 52—109 **5 Claims**



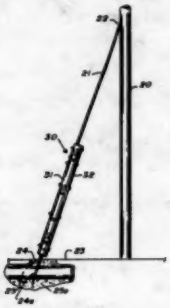
1. A theatrical stage, comprising: a plurality of side-by-side screw-operated shearlegs tables, each said table having a platform and a base member connected by shearlegs members located one above the other and each having its own operating mechanism connected to a screw located between the platform and the base member, wherein the vertical movements of the platform is accomplished by the screw being pivotally connected to the shearlegs members at their common pivot points by transmission members, each transmission member including a pair of linkage arms in which one linkage arm is pivotally connected to the screw and the other linkage arm is pivotally connected to the common pivot point of the shearlegs members by the aid of which the vertical movement of each platform is almost linear in relation to the rotation of each said screw, and wherein the vertical movements of each shearlegs table platform is synchronized by using for each said operating mechanism an electric-hydraulic step motor connected to the screw.

4,638,611

GUY-WIRE GUARD ASSEMBLY AND FASTENING SYSTEMS THEREFOR

Charles R. Vaughn, P.O. Box 33417, San Diego, Calif. 92103

Filed Jan. 6, 1986, Ser. No. 816,553
Int. Cl.[4] E04H *12/20*
U.S. Cl. 52—147 **53 Claims**



1. A guard assembly for a guy-wire connected to a ground anchor rod, said guard assembly comprising

an elongate generally semi-tubular body having an arcuate, generally semicircular portion and at each end thereof a tangentially extending extension portion, said extension portions being parallel to each other, said body having an inner wall and an outer wall,

a plurality of bolts, each extending diametrically across the body between said parallel extension portions, each bolt having a head at one end and a nut threaded on the other end, to secure said body around said wire, so that the wire lies between the bolts and the arcuate portion of said body,

one said bolt being near the lower end of said body, and another said bolt being spaced therefrom and near the upper end of said body,

said guard body having at least one circumferentially aligned pair of fastener openings through its said arcuate portion, and

a fastener combination for each said pair of fastener openings for holding the guy wire or rod against the inner wall of said body, comprising two principal members, namely a bolt member with a head bearing on said outer wall outside the guard assembly and extending inwardly through one said fastener opening to a nut at its inner end and a locking washer member inside said guard assembly, having a flat portion with an opening therethrough, said bolt-like member passing through said opening inside the area enclosed by said guard assembly, between said head and said nut, and an end tab of said locking washer member extending out at an angle from one end of said flat portion to a hooked outer end extending through the other said fastener opening and engaging the outer wall of the adjacent guard body, whereby either the guy wire or the ground anchor rod can be clamped between said guard body and said flat portion in a location between said bolt member and said end tab.

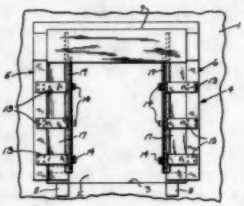
4,638,612

DOCK SHELTER

Mark A. Bennett, Milwaukee, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Jan. 6, 1986, Ser. No. 816,346
Int. Cl.[4] E04H *14/00*
U.S. Cl. 52—173 DS **18 Claims**

1. A dock shelter to be mounted alongside the doorway in a dock, comprising a resilient pad mounted on the dock and projecting outwardly from said dock, a flexible panel secured to the outer end of the pad and extending inwardly from the pad toward the center of the doorway and disposed at an acute angle with respect to the dock, an arm connected to the inner end of the panel and extending outwardly in a direction away from the dock, said arm being disposed at an angle of about 90°



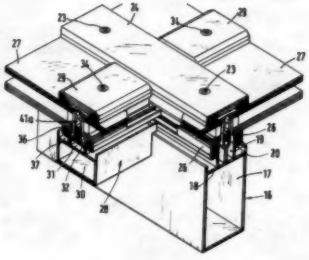
with respect to said panel, the rear end of a truck backing toward said dock engaging said panel to deflect said pad and thereby move the panel into engagement with the side of the truck and simultaneously move the arm into engagement with the end of the truck body.

4,638,613

METAL-GLASS STRUCTURE FOR A FRONT WALL OR A ROOF

Armin Tönsmann, Bielefeld, Fed. Rep. of Germany, assignor to Schüco Heinz Schürmann GmbH & Co., Bielefeld, Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 738,023
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419538; Jul. 26, 1984, 3427511
Int. Cl.[4] E04B *2/88*
U.S. Cl. 52—235 **16 Claims**



1. In a metal-glass structure for a front wall or a roof, comprising a metal framework having flats covered with glass panels, said framework including a plurality of main frame sections at a building side, a plurality of crossbar frame sections extending transversely of said main frame sections, and a plurality of cover profiles screwed to said main and crossbar frame sections and extending over edges of said glass panels, said main frame sections, said crossbar frame sections and said cover profiles having anchoring grooves and sealing strips partially received in said anchoring grooves, respectively and supported on the edges of the glass panels, said main and crossbar frame sections each enclosing a hollow chamber and being provided with gutters for condensed water and grooves for percolating water, the improvement comprising each groove (32) for percolating water in each crossbar frame section (28) having a bottom wall (41) which extends up to an upper edge of a respective groove (19) for percolating water of an adjacent main frame section (16) and is supported against said upper edge, each main frame section having two longitudinal grooves being defined by outer profiled wall portions which form the anchoring grooves (25) for receiving first

sealing strips (26), each crossbar frame section having at least two anchoring grooves (35) for receiving second sealing strips (36), said two anchoring grooves having the same height as that of said grooves (32) for percolating water, the height of said first sealing strips (26) being greater than that of said second sealing strips, said first and second sealing strips being supported against a common face of a respective glass panel, and said two anchoring grooves (35) for the sealing strips having bottom walls which in a region of overlapping are supported on walls of the anchoring grooves (25) of the adjacent main frame section.

4,638,614

ADJUSTABLE ROOM PARTITION

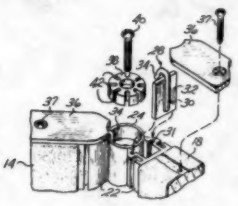
Roger H. Wilcox, 56862 Inwood Ct., Elkhart, Ind. 46516

Continuation-in-part of Ser. No. 762,630, Aug. 5, 1985, Pat. No. 4,601,145. This application Apr. 11, 1986, Ser. No. 850,531

The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

Int. Cl.[4] E04B *1/343;* A47G *5/00*

U.S. Cl. 52—238.1 **5 Claims**



1. A room partition comprising a plurality of partition members, each partition member including spaced end edges and top and bottom edges, one of said end edges positioned adjacent an end edge of a second partition member, a post positioned between said partition member adjacent end edges, a hook secured to each partition member at one of said top and bottom edges, and said hooks constituting means for rotatably securing said partition members to said post wherein said partition members are shiftable between a multiplicity of positions and a cap member removably secured to one of said post top and bottom edges, said cap member constituting means for securing said partition members in one of said multiplicity of positions, each partition including first and second faces, a vertical groove cut in one of said partition member first and second faces, shelf support means secured in said groove for supporting a generally horizontal shelf.

4,638,615

METALLIC STRUCTURAL MEMBER PARTICULARLY FOR SUPPORT OF WALLS AND FLOORS OF BUILDINGS

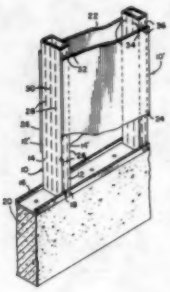
Lawrence H. Taylor, P.O. Box 49-58, 48th St. Station, Union City, N.J. 07087

Filed Oct. 17, 1985, Ser. No. 788,643

Int. Cl.[4] E04C *3/30*

U.S. Cl. 52—364 **5 Claims**

1. A structural metallic member particularly useful for forming interior and exterior wall, floor and ceiling support means of building structures consisting of a hollow, generally quadrangular in transverse crossection stud consisting of at least three contiguous walls comprising a pair of end walls and middle wall connecting the pair of end walls at a pair of corners, each of said walls having lengths and widths such as to form the structural member, the middle of the at least three walls being provided with a multiplicity of parallel, spaced, longitudinal rows of longitudinally spaced slits and each of the pair of end walls of the three walls being provided with a row of longitudinally spaced slits spaced about ½ the width of the end walls adjacent the corner contiguous with the middle wall said slits having a width of about 15,000 ths. of an inch to



thereby reduce transmission of heat and sound there across and prevent convection of air currents therethrough.

4,638,616

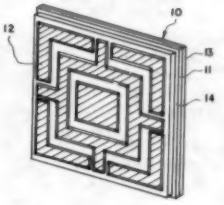
THERMALLY INSULATIVE SELF-SUPPORTING PANEL

Chester P. Fredericks, 3535 W. 72nd Pl., Chicago, Ill. 60629

Filed Sep. 26, 1985, Ser. No. 780,654

Int. Cl.[4] E04B *1/80, 1/90*

U.S. Cl. 52—397 **6 Claims**



1. A ceiling panel comprised of:

(a) a rigid center portion of rectangular perimeter comprised of gypsum board having flat upper and lower surfaces,

(b) a lower layer of compact inorganic material associated with the lower surface of said center portion, having a downwardly disposed contoured surface and having a perimeter uniformly inwardly displaced from the perimeter of said center portion, thereby forming a shoulder,

(c) a resilient flat sealing strip associated with said shoulder as a continuous border, and

(d) an upper stratum of low heat transfer material disposed upon the upper surface of said center portion,

(e) the weight and perimeter of the panel being such that the sealing strip experiences a downward force between about 1.5 and 4.5 pounds per linear foot.

4,638,617

REFRACTORY CURTAIN WALL

Barry R. James, Apple River, Ill., assignor to Merkle Engineers, Inc., Galena, Ill.

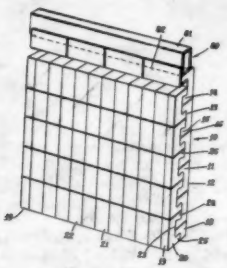
Filed Oct. 19, 1984, Ser. No. 662,576

Int. Cl.[4] E04C *1/04;* E06B *3/54*

U.S. Cl. 52—474 **20 Claims**

1. In a vertically suspended refractory curtain wall comprising two courses of refractory shapes; a first course comprising a plurality of adjacent horizontal rows each comprising a plurality of side-by-side rectangular refractory shapes each having a solid rectangular flat exposed face and an opposite

face having a horizontal central through recess parallel to a plane of said refractory curtain wall and portions extending above and below said recess, the portion of the refractory extending above said recess forming an upper horizontal hanger portion and the portion of the refractory extending below said recess forming a lower horizontal hanger portion; and a second course comprising a plurality of adjacent horizontal rows each comprising a plurality of side-by-side rectangular refractory shapes each having a solid rectangular flat exposed face and an opposite face having a horizontal central through recess parallel to a plane of said refractory curtain wall and portions extending above and below said recess, the



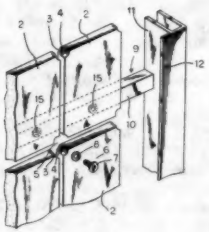
portion of the refractory extending above said recess forming an upper horizontal hanger portion and the portion of the refractory extending below said recess forming a lower horizontal hanger portion; said lower horizontal hanger portions of one said horizontal row of said first course refractories fitting within the upper portion of said horizontal recesses of one said horizontal row of said second course refractories, thereby suspending said second course refractories and said upper horizontal hanger portions of an adjacent lower said horizontal row of said first course refractories fitting within the lower portion of the same said horizontal recesses of said second course refractories thereby suspending said adjacent lower horizontal row of said first course refractories.

4,638,618

DECORATIVE PANELS COMPRISING REPLACEABLE DECORATIVE SHEETS

Takashi Iesaka, Tokoname; Takaaki Wada, Handa; Ikumi Ohta, Mie, and Masayuki Izumi, Setagaya, all of Japan, assignors to Inax Corporation and Japan Alpha Corporation, both of, Japan

Filed Jul. 10, 1985, Ser. No. 753,415
Claims priority, application Japan, Mar. 4, 1985, 60-30471
Int. Cl.[4] E04F *13/00*
U.S. Cl. 52—509 **20 Claims**



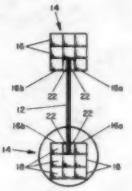
1. A decorative panel comprising thin right-angled tetragonal rigid decorative sheets assembled without substantial gaps and replaceably installed on a structural support by the use of fixing means having flanges at the heads thereof; said decorative sheet having substantially quarter-round cutouts at the corners thereof and substantially quarter-round depressions adjacent to the cutouts; each of the corners of four decorative sheets assembled together forming a cut-out hole and a depression around the hole; said structural support containing mating means for the fixing means; the cut-out holes of the assembled sheets being arranged on the mating means; the fixing means being fitted to the mating means through the cut-out holes; the flanges at the heads of the fixing means being recessed on the depressions around the cut-out holes; the heads of the fixing means recessed on the depressions being not higher than the level of the decorative surface of the decorative sheets; the fixing means having an inner hole at the head thereof and the inner holes holding therein a decorative cap, a soft cap for pinning, a hook, a hanger, a magnet or magnetizable piece, and/or a rod for supporting a shelf.

4,638,619

WOOD I-JOIST AND METHOD OF FABRICATING THE SAME

David C. Fischetti, 903 W. Maynard Rd., Cary, N.C. 27511

Filed Dec. 19, 1983, Ser. No. 563,181
Int. Cl.[4] E04C *3/30*
U.S. Cl. 52—729 **9 Claims**



3. A fabricated I-joist comprising: upper and lower elongated wood flange assemblies, each wood flange assembly including a plurality of elongated wood member subassemblies that extend throughout the length of each wood flange assembly and which include a series of individual elongated wood members secured together in end-to-end relationship; means for securing the individual wood members together in end-to-end relationship to form respective elongated wood member subassemblies, said securing means including glue applied between respective ends of the individual wood members for securing the same together in end-to-end relationship; means for securing said formed elongated wood member subassemblies together in side-by-side relationship to form a respective wood flange assembly having a cross sectional area comprised of a series of said individual wood members, said means for securing said elongated wood member subassemblies together in side-by-side relationship including glue applied between respective wood member subassemblies; each formed wood flange assembly including an inner side having two spaced apart wood member subassemblies that define and naturally form an elongated web receiving opening therebetween; an elongated web assembly disposed between said inner sides of said elongated wood flange assembly wherein said web assembly has a thickness less than the width of each of said openings formed about the inner side of the respective wood flange assemblies; said elongated web assembly including two outer edge portions that extend into the respective formed web receiving openings formed about the inner sides of said respective wood flange assemblies; and means for securing the outer edge portions of said web assembly in and to said web receiving openings of said wood flange assemblies formed by the spacing of said two elongated wood member subassemblies apart so as to form an integral fabricated wood I-joist having a pair of upper and lower wood flange assemblies comprised of both face and edge glued wood members and wherein the respective wood flange assemblies are specifically designed and formed with said web receiving openings existing specifi-

cally to receive said web assembly, said means for securing said plywood web in said web receiving opening of the respective wood flange assemblies including wedge means that are driven into said web receiving opening between each side of said web assembly and an adjacent elongated wood member subassembly forming said web receiving opening so as to securely bind said web assembly between said wedge means.

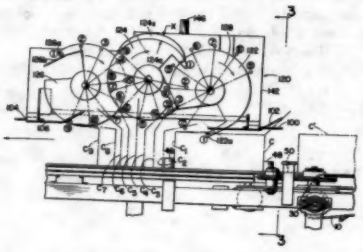
8. A method of forming a prefabricated wood I-joist comprising the steps of: forming a plurality of elongated wood member subassemblies by gluing and securing a plurality of individual wood members, having a generally uniform and generally square cross sectional area, together in end-to-end relationship; gluing and securing said formed elongated wood member subassemblies together in side-by-side relationship to form upper and lower elongated wood flange assemblies, each wood flange assembly being comprised in cross sectional area of a plurality of said generally square individual wood members; forming an inner side for each wood flange assembly by providing two elongated wood member subassemblies in spaced apart relationship so as to define and naturally form an elongated opening between the two spaced apart elongated wood member subassemblies; mounting a web assembly between the two inner sides of said upper and lower wood flange assemblies by inserting opposite outer edge portions of said web assembly into said web receiving opening formed about the inner side of said wood flange assemblies; and securing each outer edge portion of said web assembly into said web receiving opening so as to form an integral wood I-joist comprised of said web assembly secured between the inner sides of said wood flange assemblies and wherein the wood flange assemblies include both face and edge glue joints and wherein respective elongated wood member subassemblies comprise a plurality of individual wood members joined end to end and wherein the same wood member subassemblies are secured together in side-by-side relationship, the step of securing respective outer edge portions of said web assembly in and to said web receiving openings including the step of driving wooden wedge members into said web receiving openings between each side of said plywood web and adjacent respective wood member subassemblies forming said web receiving opening.

4,638,620

CARTON FLAP OPENER

Lloyd D. Johnson, Portland, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed Apr. 23, 1985, Ser. No. 726,093
Int. Cl.[4] B65B *43/38*
U.S. Cl. 53—382 **6 Claims**



1. In a machine of the type wherein upwardly open packing cases are moved in spaced relationship to one another and in a downstream direction toward a station where they are to be loaded, each case having leading and trailing top flaps hingedly connected to the front and rear end panels respectively, and wherein these top flaps are to be opened prior to arrival of the case at such a load station, the improvement comprising

(a) leading front top flap opening mechanism provided above the path of movement of the cases and including rotating flap engageable wheels clustered so that their axes are spaced from one another less than one half their combined diameters, and so that their respective peripheries have segments overlapping one another at least slightly,

(b) adjacent wheels of said clustered wheels displaced axially relative to one another at least in the region where their segments overlap, said wheels having substantially the same rotational speeds, which wheels speed results in tangential peripheral speeds for the wheels exceeding that of the speed of movement of the cases moving in the downstream directions below said adjacent wheels,

(c) one of said adjacent clustered wheels defining a radially outwardly open notch with a first side trailing a second notch side as viewed in the direction of wheel rotation, said first notch side defined more particularly by a radially outwardly and tangentially forwardly projecting portion of said one wheel periphery, said one wheel projecting portion adapted to move downwardly into the packing case and then upwardly at a peripheral speed greater than that of the packing case to raise the leading top flap as said one wheel portion continues to rotate through an angle at least approximately equal to the corresponding angular displacement of the top flap itself as measured from an initial closed position relative the case,

(d) another of said adjacent wheels also defining a radially outwardly open notch with first trailing and second leading notch sides, said first notch side so defined in said another adjacent wheel and said wheels so timed relative to one another that said another wheel notch has its trailing notch side engageable with said leading top flap as said projection portion moves upwardly out of contact with the leading top flap to fold the latter through an additional angle which is approximately equal to the corresponding additional angular displacement of the top flap as measured from its initial closed position and after said angular displacement acheived by said one wheel projecting portion,

(e) a third clustered wheel adjacent said another of said clustered wheels and having its axis spaced from said another wheel less than one half their respective combined diameters so that their respective peripheries have segments that overlap one another at least slightly, said third wheel arranged downstream of said one and said another wheel cluster and also defining a radially outwardly open notch with a first side trailing a second notch side as viewed in the direction of wheel rotation, all of said wheels rotating in the same direction.

4,638,621

METHOD AND SYSTEM FOR PROCESSING AQUATIC PLANTS

E. Allen Stewart, III, Cocoa, and Evan L. Keesling, Lake Helen, both of Fla., assignors to Amasek, Inc., Cocoa, Fla.

Continuation-in-part of Ser. No. 533,012, Sep. 16, 1983, Pat. No. 4,520,616. This application Feb. 19, 1985, Ser. No. 703,144
Int. Cl.[4] A01D *44/00*
U.S. Cl. 56—9 **29 Claims**

1. An apparatus for harvesting and processing aquatic plants comprising:

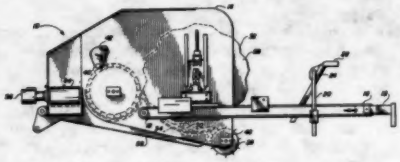
a first drum adapted for positioning in a water reservoir containing aquatic plants, said first drum having a plurality of surface projections for engaging the plants and being rotatable in a direction to lift the plants over said first drum;

a second drum having a plurality of spiral wound projections, said second drum being positioned above said first drum and being rotatable in a direction to engage and direct the plants on said first drum along a passageway;

a third drum having a plurality of tooth-like projections, said third drum being positioned at an end of the passageway

whereby plants directed along the passageway by said second drum are picked up by said toothlike projections on said third drum;

a cutter bar positioned against said third drum;



means for rotating said third drum whereby the plants are shredded by being driven into said cutter bar; and

means for collecting the shredded plants.

4,638,622

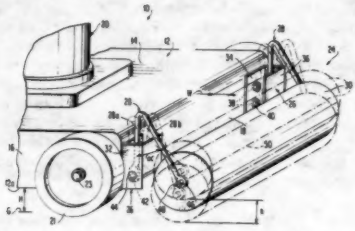
SAFETY ROLLER ASSEMBLY FOR BRACKET MOUNTING TO THE TOP OR REAR FACE OF ROTARY LAWN MOWER DECK

David C. Smith, Rte. 3, Box 630, Proctorville, Ohio 45669

Filed Dec. 18, 1985, Ser. No. 810,129

Int. Cl.[4] A01D *53/08*

U.S. Cl. 56—17.4 **3 Claims**



1. A safety roller assembly for mounting to a rotary lawn mower, said rotary lawn power mower being of a type having a hollow mower deck comprising at least a top wall, spaced lateral sidewalls and a vertical rear wall, a horizontal blade rotatably mounted within the hollow mower deck and a plurality of vertically adjustable wheels mounted to the side walls of said lower deck for adjustably elevating the mower deck off the ground and for controlling the cutting height of the mower, said safety roller assembly comprising; a pair of U-shaped mounting brackets, said mounting brackets including a base and integral, right angle legs extending generally parallel to each other from opposite sides of said base, a pair of angle arms, said angle arms having integral branches angled relative to each other, means for pivoting the free end of one branch of said angle arms to the base of respective U-shaped bracket, a roller of a length generally equal to the length of the mower deck rear wall and extendable thereacross, axle means carried axially by said roller for mounting said roller for rotation about its axis, means for fixing said axle, at respective ends, to the free ends of the other branches of said angle arms, means for fixedly mounting one of said bracket legs of both brackets to one of said top wall and rear wall of said mower deck such that the one branch of the angle arms appended to the base of the U-shaped brackets respectively pivots to an extent limited by the bracket legs, thereby controlling the vertical travel of the safety device roller, and wherein the length of said branches of said angle arms and the angle therebetween and the position of the brackets on the mower deck are such that the periphery of the roller is maintained in contact with the ground during movement of the roller to follow the contour of the ground with the roller rising and falling to the extend limited by the distance between the legs of said U-shaped brackets.

4,638,623

ROUND BALING PRESS

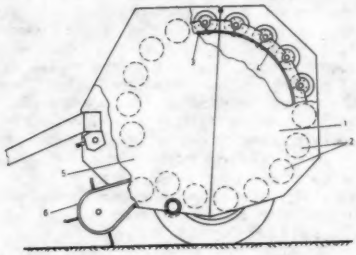
Siegfried Schaible, Singen, and Edwin Schneble, Gailingen, both of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz AG Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,189

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320715

Int. Cl.[4] A01D *39/00*

U.S. Cl. 56—341 **2 Claims**



1. A round baling press with a pick-up device to pick up the crop material having a rolling chamber with side walls on which a plurality of rollers each mounted on bearing shafts are mounted rotatably in bearing housing orifices, characterised in that outwardly opening substantially semi-circular bearing housing orifices extend as indentations about the external circumference of a pair of spaced rolling chamber side walls into which the bearing shafts are radially inserted, rollers are provided with pre-assembled flanged bearing halves retained thereon and means connecting the flanged bearing halves, having been radially inserted into said bearing housing orifices, by a part of their circumference to the rolling chamber side walls, about said semi-circular orifice.

4,638,624

FALSE TWIST CRIMPED YARN HAVING IMPROVED COHERENCY

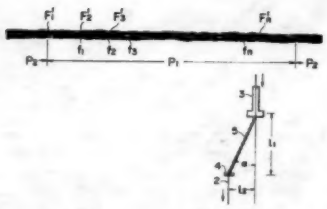
Soichi Hakoyama, Kobe; Shigetatu Mori, Kanazawa; Yoshiyuki Takebe, Kanazawa, and Kanya Imaoka, Kanazawa, all of Japan, assignors to Teijin Limited and Kitanihon Spinning Co., Ltd., both of, Japan

Filed Nov. 22, 1983, Ser. No. 554,406

Claims priority, application Japan, Nov. 22, 1982, 57-203681

Int. Cl.[4] D01H *7/92;* **D02G** *1/06, 3/38*

U.S. Cl. 57—208 **6 Claims**



1. A false twist crimped yarn comprised of a single false twist crimped yarn having a loose structure and consisting

essentially in filaments having substantially the same characteristics and having a plurality of spaced apart coherent structures of smaller thickness than said loose structure wherein at least one of said coherent structures is comprised of a bundle of filaments having substantially no twist and is bound spirally by several wrapping filaments in a direction conforming to the false twist with said wrapping filaments being part of said single yarn and said bundle of filaments being the remaining filaments of said single yarn and at least one co-existing additional coherent structure is comprised of a different configuration.

4,638,625

PROCESS AND APPARATUS FOR STOPPING AND RESTARTING AN OPEN-END SPINNING MACHINE WITH A PLURALITY OF SPINNING DEVICES

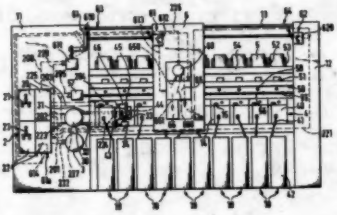
Kurt Lovas, Böhmfeld, and Franz Deisinger, Ingolstadt, both of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik, Ingolstadt, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 462,023

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205535

Int. Cl.⁴ D01H *15/02*

U.S. Cl. 57—263 12 Claims



1. A process for stopping and restarting an open-end spinning machine with a plurality of spinning devices, each of which contains a spinning cell working under vacuum and having a fiber-collecting surface, and a spooling device, said process comprising the steps of

stopping all the spinning device together while further maintaining the vacuum;

successively preparing the thread end resulting from the interruption of the spinning process at each spinning unit for thread-joining;

feeding each prepared thread end to its respective spinning device in a thread-joining position;

then, cutting off the vacuum;

starting the open-end spinning machine after the vacuum has been applied;

feeding the threads located in the thread-joining position together, on all the spinning devices, to the respective fiber collecting surfaces thereby joining threads at all spinning devices and obtaining high grade piecers;

before the vacuum is cut off, performing the steps of: delivering up the thread to the fiber-collecting surfaces of the already stopped spinning cells and, before the spinning cells are put into operation, bringing the threads into the thread-joining position by drawing the threads simultaneously and partially out of the spinning cells while forming thread-joining reserves at the same time, said thread-joining reserves being released simultaneously after the spinning cells have been put into operation; and

drawing the ends of the threads partially out of the spinning cells to form thread reserves and securing the threads in this position against untwisting.

4,638,626

FIBER FEED CHANNEL ARRANGEMENT FOR OPEN END FRICTION SPINNING MACHINE

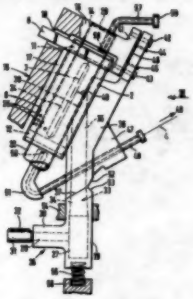
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Uberkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,457

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3443901

Int. Cl.⁴ D01H *1/135, 7/898*

U.S. Cl. 57—401 25 Claims



1. An apparatus for open-end friction spinning including a pair of adjacently arranged friction rollers, both said rollers being rotatably disposed in a single common structural unit means, and fiber feeding duct means having a mouth portion, said rollers defining a yarn forming wedge-shaped gap therebetween and said mouth portion extending along said wedge-shaped gap, comprising:

rigid connecting means for fixedly connecting said mouth portion of said fiber feeding duct means to said single common structural unit means rotatably supporting said pair of rollers, thereby causing said mouth portion to be positively located relative to said wedge shaped gap.

4,638,627

WRISTLET HAVING LINKS

Andreas Wullschleger, Lengnau, and Othmar Brunner, Langendorf, both of Switzerland, assignors to ETA SA Fabriques d'Ebauches, Grenchen, Switzerland

Filed May 22, 1985, Ser. No. 736,738

Claims priority, application France, Jun. 8, 1984, 84 09177

Int. Cl.⁴ F16G *13/00*

U.S. Cl. 59—80 13 Claims

1. A wristlet comprising a succession of links and of hinged connection elements for hingedly connecting adjacent links to each other:

wherein each connection element has two parts, each of said parts having an upper face and a lower face and one of said parts being permanently secured by its upper face to one adjacent link and the other of said parts being permanently secured by its upper face to the other adjacent link;

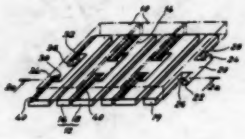
wherein each of said two parts of the connection element has a male member and a female member, the male member of each part being received in and cooperating with the female member of the other part, the male member of one of said parts being generally cylindrical with an axis providing a hinge axis between said two parts, and the male member of the other of said parts being generally parallel-epipedic;

wherein the upper faces of said two parts are each covered by a portion of each of the two adjacent links to prevent the male member of each part from moving out of the

female member of the other part in the direction of said upper faces;

wherein the parallelepipedic male member of the other of said two parts of the connection element is relieved by a bevel in the region thereof contiguous to the link secured to the one of said two parts provided with the generally cylindrical male member to enable said two parts to pivot relative to each other about said hinge axis, the scope of said pivotal motion being defined by the slope of said bevel;

wherein a curved surface of said generally cylindrical male member contacts a substantially planar surface of said generally parallelepipedic male member along substantially a line of contact;



wherein each of said links comprises a plate each end of which in the direction of said succession of links has a substantially planar end face, the end faces of the plates of adjacent links being in opposed relation so as to define a border region between said plates positioned substantially above said line of contact;

wherein said generally cylindrical male member is fitted substantially without play into said cooperating female member and they play between adjacent links in the border region between said plates is sufficiently small that the male member of each part of said connection element is prevented from moving out of the female member of the other part in the direction of the lower faces of said two parts; and,

wherein the lower faces of said connection element parts are exposed to form the bottom side of said wristlet.

4,638,628

PROCESS FOR DIRECTING A COMBUSTION GAS STREAM ONTO ROTATABLE BLADES OF A GAS TURBINE

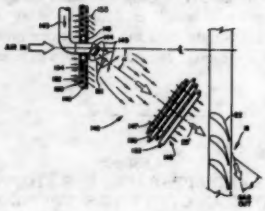
Ivan G. Rice, P.O. Box 233, Spring, Tex. 77373

Division of Ser. No. 486,334, Apr. 19, 1983, Pat. No. 4,545,197, and a continuation-in-part of Ser. No. 274,660, Jun. 17, 1981, abandoned, which is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, and a continuation-in-part of Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, which is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953. This application Mar. 26, 1985, Ser. No. 716,373

Int. Cl.[4] F02C *7/00*

U.S. Cl. 60—39.02 **3 Claims**

1. In a process for directing a combustion gas stream onto the surfaces of rotatable blades to produce work comprising; directing compressed air along a linear inlet flow path to a combustor, igniting said compressed air and a combustible fuel in said combustor to form a combustion gas, directing said combustion gas from said combustor as a combustion gas stream along a second linear flow path to a gas nozzle which is positioned upstream of said blades, said gas nozzle turning said combustion gas stream from said second flow path to an exit flow path necessary to extract the desired amount of work from said rotatable blades, the angle formed by the intersection of said second flow path and said exit flow path being the vane turning angle and is the amount said combustion gas stream is



displaced from said second flow path by said gas nozzle, the improvement comprising; turning said combustion gas stream in said combustor from said inlet flow path to said second flow path whereby said vane turning angle is reduced relative to the vane turning angle formed by the intersection of said inlet flow path and said exit flow path.

4,638,629

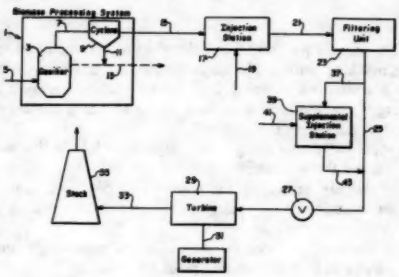
PROCESS FOR ELECTRIC POWER PRODUCTION USING A BIOGAS

David H. Archer, Pittsburgh; Frank I. Bauer, Perry Township, Perry County, and Edward J. Vidt, Churchill Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 668,591, Nov. 5, 1984, abandoned. This application Mar. 19, 1986, Ser. No. 841,670

Int. Cl.[4] F02C *3/28*

U.S. Cl. 60—39.05 **7 Claims**



1. A process for the production of electric power with a biogas used as a fuel for an electric power producing combustion turbine which drives a generator, which turbine will accept such a biogas only at a temperature below a predetermined temperature, wherein a biomass is gasified to produce a hot stream of a biogas, said biogas being at temperatures of between about 650°–875° C. and containing vaporized tar components and solid particulate matter, characterized in that:

said hot stream of biogas, consisting essentially of a biogas, vaporized tars and solid particulate matter, has water injected thereto to partially cool the biogas to a temperature below said predetermined temperature by vaporization of said water, but above a temperature at which said vaporized tars in said biogas would condense out of said stream;

filtering said partially cooled biogas to remove said particulate matter; and

directly charging said partially cooled, filtered biogas containing said vaporized water and vaporized tars to an

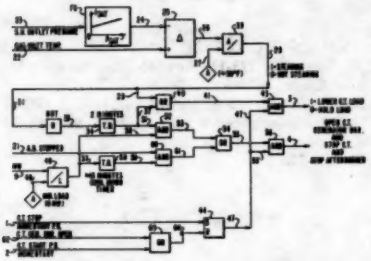
electric power producing combustion turbine to produce electric power.

4,638,630

COOLDOWN CONTROL SYSTEM FOR A COMBINED CYCLE ELECTRICAL POWER GENERATION PLANT

Alan Martens, Berwyn, and Bennie E. Snow, West Chester, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 27, 1984, Ser. No. 686,956
Int. Cl.[4] F02C 6/18
U.S. Cl. 60—39.182 4 Claims



1. In a combined cycle electrical power plant including a steam turbine, a heat recovery steam generator for supplying steam to the steam turbine, a gas turbine for supplying heat to the heat recovery steam generator, said steam generator and gas turbine each producing electrical power under load, the gas turbine having a control circuit determining the operation thereof; the combination of:

first means for detecting one of a steaming condition and a non-steaming condition in said heat recovery steam generator;

second means responsive to said steaming condition and to a gas turbine STOP signal for reducing the load of said gas turbine toward a minimum load level;

third means responsive to said non-steaming condition and to said minimum load level being reached for generating a STOP command and applying said STOP command to the control circuit of said gas turbine, thereby to indicate a sequence of steps to stop the gas turbine.

4,638,631

MULTIFLOW TURBO JET ENGINE SECONDARY FLOW ADJUSTING DEVICE

Pierre Debeneix, Saint Sauveur sur Ecole, and Marcel J. Tournere, Paris, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A." , Paris, France

Filed Aug. 6, 1984, Ser. No. 637,834
Claims priority, application France, Aug. 18, 1983, 83 13418
Int. Cl.[4] F02K 3/02
U.S. Cl. 60—226.3 9 Claims

1. In a multiflow turbojet engine having an annular secondary duct defined by inner and outer annular walls,

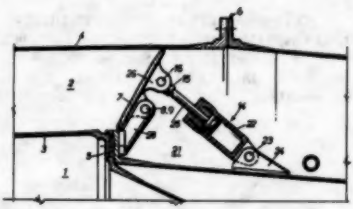
a secondary flow regulating device for varying the passage section of said annular secondary duct including:

partly-annular vanes regularly distributed within the annular secondary duct of the engine,

each vane being movable about two circumferentially-spaced fixed pins,

the axis of two pins of any one vane being a continuation one of the other so that at the center of each vane of the common axis is tangential to an imaginary circle within the annular secondary duct, and means located downstream of said vane for operatively controlling each vane for pivoting the vane about the pivot pins thereof,

the control means being disposed downstream of the vane with respect to the direction of flow of the secondary air and being secured to one of said walls of the annular secondary duct and to a part of the vane wherein each vane has an axis of radial symmetry and two lugs provided with bores, said pins are engaged in the bores, and wherein



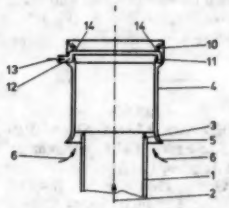
brackets are mounted on said inner wall of the annular secondary duct, said brackets having bores within which said pins are disposed and a clevis arranged on said axis or radial symmetry of each said vane and in an opposite half in a radial sense to a half having the lugs, the clevis being connected with the control means.

4,638,632

EXHAUST GAS PIPE COOLED BY AMBIENT AIR

Rudolf Wulf, Göttingen, and Wolfgang Stilger, Hann-Münden, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt für Luft-und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 517,160, Jun. 16, 1983, abandoned, which is a continuation of Ser. No. 245,112, Mar. 18, 1981, abandoned. This application Feb. 27, 1985, Ser. No. 705,419
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010598
Int. Cl.[4] F01N 3/02
U.S. Cl. 60—319 7 Claims



1. Exhaust gas pipe with a free end cooled by ambient air, and for the removal of hot gases from drive means, comprising: a jacket part surrounding said exhaust gas pipe in the region of said free end and beyond said free end in outflow direction, a ring-shaped chamber between said jacket part and said exhaust gas pipe for the passage of cooling ambient air, cooling ambient air and hot exhaust gases mixing in a mixing zone, said cooling ambient air passing through said ring-shaped chamber being directed substantially along the inner wall of said jacket part and preventing hot exhaust gases and mixing zone gases from contacting the inner wall of said jacket part, said jacket part surrounding said exhaust gas pipe and being free from contact with said exhaust gas, said jacket part forming with said free end of the exhaust gas pipe an ejector for the admixing of cool ambient air, said jacket part having at all locations a greater diameter than the exhaust gas pipe, a visibility angle being formed by lines connecting mouths of said exhaust gas pipe and said jacket part, said jacket part having a diameter which is related to the length of said jacket part so that the visibility angle on the end of the exhaust gas pipe is reduced substan-

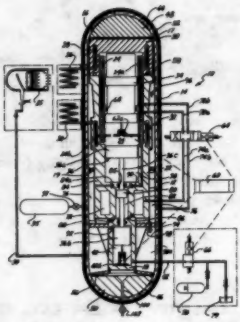
tially from 180°, an annular conduit in said jacket part for supplying auxiliary air under pressure, said annular conduit having nozzle means for blowing said auxiliary air to the inner wall of the jacket part.

4,638,633

EXTERNAL COMBUSTION ENGINES

John L. Otters, 11317 Miller Rd., Whittier, Calif. 90604

Filed Oct. 22, 1985, Ser. No. 790,039
Int. Cl.[4] F02G *1/04, 1/06*
U.S. Cl. 60—518 33 Claims



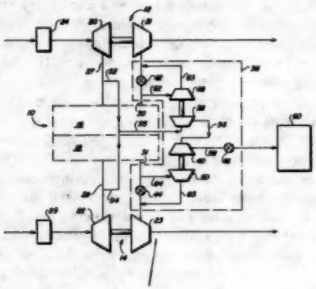
1. In a thermal machine of the type including a machine body having a main axis extending between a thermal end and a work end, a working fluid at relatively high pressure in a working fluid chamber defined in said body and a displacer element reciprocable in said chamber for displacing the working fluid between a hot space and a cold space of said working fluid chamber for subjecting the fluid to a thermodynamic cycle in cooperation with a work piston, the improvement comprising outer shell means enclosing said machine body for maintaining at atmosphere of said working fluid about said machine body at a pressure substantially lower than in said working fluid chamber.

4,638,634

ENGINE POWERED AUXILIARY AIR SUPPLY SYSTEM

John R. McLean, San Pedro, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 4, 1985, Ser. No. 784,133
Int. Cl.[4] F02B *33/44*
U.S. Cl. 60—612 21 Claims



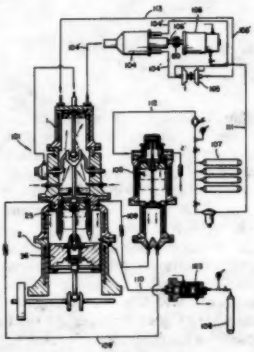
1. An auxiliary air supply system comprising:
an engine;
at least one exhaust driven turbocharger including a turbine and a compressor associated therewith for supply of compressed air to the engine;
a low pressure compressor including means for powering said low pressure compressor utilizing the engine exhaust gas and flow connected to receive a portion of the compressed air exiting said engine turbocharger compressor;
a high pressure compressor including means for powering said high pressure compressor utilizing the engine exhaust gas and flow connected to receive the compressed air exiting the low pressure compressor; and
means for directing engine exhaust gases between said at least one engine turbocharger and said means for powering said low and high pressure compressors.

4,638,635

INTERNAL COMBUSTION ENGINE SYSTEM

Chul W. Nam, No. 225-13, Sinwoul-Dong, Kangseo-ku, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 438,647, Nov. 3, 1982, Pat. No. 4,531,480. This application May 17, 1985, Ser. No. 735,243
Int. Cl.[4] F02B *73/00*
U.S. Cl. 60—716 7 Claims



1. An internal combustion engine:
an engine body including a main combustion engine for transmitting the power generated by explosion pressure to a pumping piston and a power transmission apparatus for transmitting to a power crank shaft power that is increased by the ratio of the cross-sectional area of a combustion chamber piston to a power piston, wherein the stroke distance of the combustion chamber piston is equal to that of the power piston;
a swash plate-type stirling engine coupled to an exhaust gas outlet of said main combustion engine to be driven by exhaust heat therefrom;
a one-stage screw-type compressor coupled by a driving shaft to the swash plate-type stirling engine, thereby generating a great amount of compressed air;
a turbo-charger mounted adjacent to a gas outlet of the stirling engine to force a supply of fresh air into the combustion chamber of the main combustion engine;
a booster being mounted between a compressed air source and said power transmission apparatus to amplify the air pressure derived from the compressed air source and then provide the amplified air pressure to said power transmission apparatus by operation of a cam in accordance with the rotation of the first crankshaft;
a plurality of compressed air sources being mounted between said compressor and said booster for storing a great amount of compressed air from said compressor; and
an accumulator in communication with said power transmission apparatus through a fluid oil pipe, thereby maintain-

ing constant control of the oil pressure in said power transmission apparatus.

4,638,636

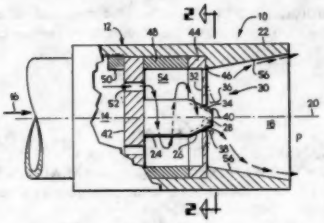
FUEL NOZZLE

Joseph D. Cohen, Danvers, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Jun. 28, 1984, Ser. No. 625,745

Int. Cl.[4] F02C *1/00*; F02G *3/00*

U.S. Cl. 60—741 9 Claims



1. A fuel nozzle comprising:

a hollow body having an inlet, an outlet and a stationary surface;

means for modulating fuel flow from said inlet to said outlet comprising a flexible pressure-responsive diaphragm fixedly mounted in said body and having an edge disposed adjacent to said body stationary surface and defining therebetween a discharge port, said port having a flow area being increasable in response to increasing fuel pressure in said inlet as said fuel pressure acts against said diaphragm to displace said edge away from said body surface; and

wherein said diaphragm is sized and configured for operating in substantially only two positions: a first position wherein said discharge port has a minimum flow area and a second position wherein said discharge port has a maximum flow area, said first position being maintainable for relatively low fuel pressures and upon reaching a predetermined intermediate pressure said diaphragm being allowed to pop into said second position, said second position being maintainable for relatively high fuel pressures.

4,638,637

VEHICLE PROPULSION PLANT

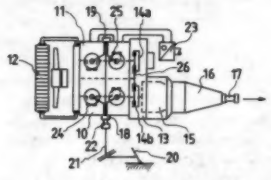
Sven O. Kronogard, deceased, late of Lomma; Allen Lindén, administrator, Gothenburg; Clas O. Kronogard, Gråbo, and Hakan Kronogard, Lund, all of Sweden, assignors to AB Volvo, Gothenburg, Sweden

Continuation-in-part of Ser. No. 302,626, Sep. 15, 1981, abandoned. This application Nov. 9, 1984, Ser. No. 669,893

Claims priority, application Sweden, Sep. 29, 1980, 8006805

Int. Cl.[4] F02B *73/00*

U.S. Cl. 60—718 2 Claims



1. A vehicle propulsion unit comprising an internal combustion engine having a plurality of cylinders for driving an output shaft, the cylinders being arranged in first and second groups in a common engine block with first and second crank shafts for the respective groups, a permanent drive connection between the first crank shaft and the output shaft, and a second drive connection including a selectively operable clutch for selectively connecting the second crank shaft with said permanent drive connection whereby the output shaft can be driven selectively by said first group of cylinders alone and by both said first and second groups of cylinders through the selective disconnection and connection respectively of said clutch, the propulsion unit including supercharging means associated with the second group of cylinders.

4,638,638

REFRIGERATION METHOD AND APPARATUS

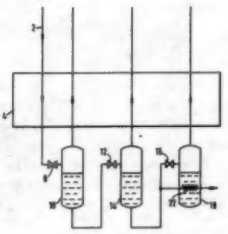
John Marshall, Ascot, and John D. Oakey, London, both of England, assignors to The BOC Group, PLC, Windlesham, England

Filed Jul. 23, 1985, Ser. No. 758,000

Claims priority, application United Kingdom, Jul. 24, 1984, 8418841

Int. Cl.[4] F25J *1/00*

U.S. Cl. 62—9 10 Claims



1. In a method liquefying a nitrogen gas stream, including the reduction of the temperature of the nitrogen gas stream at super-critical pressure to below its critical temperature in which the reduction in temperature is effected at least in part by countercurrent heat exchange with work expanded nitrogen working fluid, at least some of such working fluid being at a temperature below the critical temperature of nitrogen when it is brought into heat exchange relationship with the nitrogen gas stream; the improvement comprising withdrawing said super-critical pressure nitrogen gas stream at a temperature of 107 to 117K from heat exchange relationship with said work-expanded working fluid and subjecting the nitorgen gas stream to at least three successive isenthalpic expansions to below its critical pressure to produce a liquid and a flash gas; separating said flash gas from said liquid after each isenthalpic expansion, wherein liquid from each isenthalpic expansion, except the final insenthalpic expansion, is the fluid that is expanded in the immediately succeeding expansion, and heat exchanging at least some of the said flash gas with said super-critical pressure nitrogen gas stream.

4,638,639

GAS REFRIGERATION METHOD AND APPARATUS

John Marshall, Ascot, and John D. Oakey, London, both of England, assignors to The BOC Group, plc, Windlesham, England

Filed Jul. 23, 1985, Ser. No. 758,001

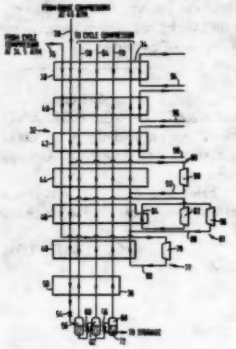
Claims priority, application United Kingdom, Jul. 24, 1984, 8418840

Int. Cl.[4] F25J *1/00*

U.S. Cl. 62—9 22 Claims

1. In a method providing refrigeration to liquify a permanent gas stream, including the steps of reducing the temperature of

the permanent gas stream at elevated pressure to below its critical temperature, and performing at least two working fluid cycles to provide at least part of the refrigeration necessary to reduce the temperature of the permanent gas to below its critical temperature, each such working fluid cycle comprising compressing the working fluid, cooling it, work expanding the cooled working fluid, and warming the work expanded working fluid in countercurrent heat exchange with the permanent



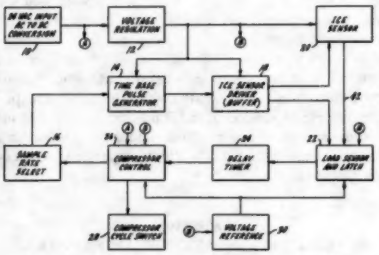
gas stream, refrigeration thereby being provided for the permanent gas stream, the improvement comprising, the condition that the working fluid is at a pressure of at least 10 atmospheres on completion of each working fluid cycle in which the working fluid is brought into countercurrent heat exchange relationship with the permanent gas stream at a temperature of the working fluid below the critical temperature of the permanent gas.

4,638,640

ICE THICKNESS CONTROLLER FOR AN ICE MAKING MACHINE

Wayne L. Whetstone, Winona, and Fredrick W. Tryan, Lewiston, both of Minn., assignors to Lake Center Industries, Winona, Minn.

Filed Oct. 25, 1985, Ser. No. 791,365
Int. Cl.[4] F25C *1/00*
U.S. Cl. 62—139 **8 Claims**



1. In an ice making machine of the type having a compressor connected to evaporator tubes submerged in a container of water, an improved ice thickness controller, comprising:

a time base pulse generator for generating an intermittent sampling pulse;

an ice sensor circuit for generating an ice level signal, including a motor connected to a power supply, the motor having a shaft extending below the water line in the container, with the ice sensor circuit monitoring the motor current to develop the ice level signal;

a load sensor and latch circuit responsive to the ice level signal to generate and maintain a compressor control signal;

an ice sensor buffer responsive to the sampling pulse to turn the ice sensor motor on and disable the load sensor and latch circuit during a sample pulse and to turn the motor off and enable the load sensor and latch circuit in the absence of a sampling pulse; and

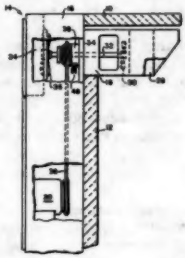
a compressor control circuit responsive to the compressor control signal to turn the compressor on and off as needed to maintain the desired ice thickness in the container.

4,638,641

TRANSPORT REFRIGERATION UNIT WITH EVAPORATOR FAN DRIVE USING RAM AIR PRESSURE

David H. Taylor, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Feb. 19, 1985, Ser. No. 703,167
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—180 **1 Claim**



1. A transport refrigeration system, comprising:

a trailer or like vehicle having an interior defined by an enclosure which includes a front wall;

and a refrigeration unit mounted on said front wall adapted to supply conditioned air to the interior of the trailer;

said refrigeration unit including a refrigerant evaporator in said enclosure; a refrigerant condenser outside said enclosure and forwardly of the front wall; an evaporator fan and a condenser fan on a common shaft which extends through said front wall between the evaporator and condenser; a refrigerant compressor; a prime mover for driving said refrigerant compressor; means selectively operating said prime mover in accordance with the temperature condition in said trailer, with said prime mover being off when the temperature is in a null band; and coupling means for selectively coupling and uncoupling said prime mover and said common shaft,

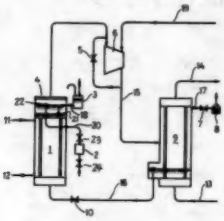
said coupling means coupling said prime mover means and said common shaft when said prime mover is operating, to drive said common shaft and cause the condenser and evaporator fans to move exterior and interior air respectively through said condenser and said evaporator, and uncoupling said prime mover and said common shaft when said prime mover is not operating;

said condenser fan being a propeller fan so that when the trailer moves forwardly with said common shaft uncoupled from said prime mover, the ram air pressure effect drives the condenser fan, and in turn the evaporator fan, to effect at least limited air circulation in the interior of said trailer while the temperature condition is in said null band.

4,638,642
HEAT PUMP

Sanji Tokuno, Hofu, Japan, assignor to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1985, Ser. No. 689,805
Claims priority, application Japan, Jan. 10, 1984, 59-2273
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—498 9 Claims

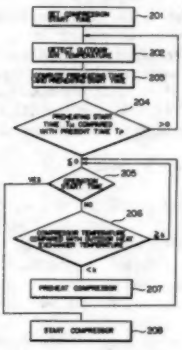


1. A heat pump operated below atmospheric pressure, said pump comprising an evaporator, a compressor and a condenser and conduit means for connecting the evaporator, the compressor and the condenser, successively, in fluid communication with each other and for providing a flow of refrigerant therethrough; said refrigerant being water, said evaporator being equipped with a feed water control device and a draining device for maintaining a liquid level of water refrigerant within a predetermined range in said evaporator and said condenser being equipped with a vacuum generating means for maintaining a vacuum within said condenser; said compressor withdrawing heated vapor from said evaporator via said conduit means at below atmospheric pressure, compressing the heated vapor, and directing the resulting pressurized vapor into the condenser.

4,638,643
CONTROL SYSTEM FOR COMPRESSOR MOTOR USED WITH AIR-CONDITIONING UNIT

Akio Sakazume; Hiroki Yoshikawa, and Hiroaki Matsushima, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,807
Claims priority, application Japan, Aug. 22, 1984, 59-173224
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—209 8 Claims



1. A control system for a compressor motor of an air condition unit comprising a refrigerant compressor having the compressor motor, an outdoor coil, a restrictor, and an indoor coil, said control system comprising:

(a) an operation switch,

(b) a microcomputer connected to said operation switch and including timer, a processing circuit and a memory for storing data on a rotating magnetic field generation signal capable of supplying a first current for generating a rotating magnetic field to the compressor motor and data on a non-rotating magnetic field generation signal capable of supplying a second current for generating a non-rotating magnetic field, said memory being supplied from the operation switch with data designating the operation start time of the heat pump, which data is stored in said memory, said microcomputer introducing data for generating a non-rotating magnetic field from said memory before the heat pump start time thereby to generate a non-rotating magnetic field generation signal, said microcomputer further introducing data for generating a rotating magnetic field from the memory after said start time to generate a rotating magnetic field generation signal,

(c) compressor motor drive means inserted between said microcomputer and said compressor motor and supplied with a non-rotating magnetic field generation signal and a rotating magnetic field generation signal from the microcomputer, said signals being applied to said compressor motor,

(d) outdoor air temperature detection means for detecting the outdoor air temperature θ_H,

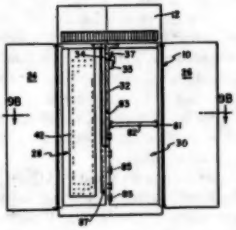
(e) means for providing a start time T (θ_H) to start introduction of the data for generating a non-rotating magnetic field from said memory in accordance with the outdoor air temperature θ_H, and

(f) means for starting generation of a signal for generating a non-rotating magnetic field at the start time T (θ_H).

4,638,644
CIRCULATING AIR REFRIGERATOR WITH REMOVABLE DIVIDER SHELF

Edward Gidseg, 16 Duke of Gloucester, Manhasset, N.Y. 11030

Division of Ser. No. 283,482, Jul. 15, 1981, Pat. No. 4,467,618, which is a division of Ser. No. 894,603, Apr. 7, 1978, Pat. No. 4,304,101. This application Feb. 28, 1984, Ser. No. 584,499
Int. Cl.[4] F25D *23/00*
U.S. Cl. 62—329 5 Claims



1. In a side-by-side combination freezer and refrigerator apparatus which utilizes circulating refrigerated air to cool and thermostatically control the temperature of at least a freezer compartment and refrigerator compartment separated by an insulated wall, the improvement in combination therewith which comprises at least one divider shelf formed at least in part of at least one insulating material and dimensioned and configured to be positioned at any of a plurality of selectable locations within at least one of said freezer and refrigerator compartments, said shelf having resilient sealing means positioned along all peripheral portions thereof to engage corresponding wall portions defining said compartment in sealed relation therewith sufficient to prevent the flow of air thereby when positiond in one of said selectable locations such that when said shelf is positioned in one of said selectable locations, said shelf divides said at least one compartment into at least

two sections and alters the flow of refrigerated air such that one section of said at least one compartment is not subject to the cooling effects of the refrigerated air and thereby inactivated and means to facilitate recirculation of the flow of refrigerated air through said insulated wall as altered by said shelf.

4,638,645

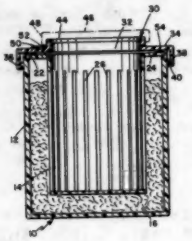
BEVERAGE CONTAINER COOLER

Eric J. Simila, 2548 Washington St., Lemon Grove, Calif. 92045

Filed Oct. 3, 1985, Ser. No. 783,404

Int. Cl.[4] F25D *3/08*

U.S. Cl. 62—457 **10 Claims**



1. A beverage container cooler, comprising:

an outer cylindrical container having an open upper end;

an inner cylindrical container having an open upper end and being coaxially mounted within the outer container with its base spaced above the bottom of the outer container, the inner container being dimensioned to receive a beverage container in a sleeve-like fashion;

the opposed inner and outer surfaces of the outer and inner container, respectively, defining a coolant chamber surrounding the cylindrical walls and base of the inner container for receiving a coolant material;

the inner container having a plurality of openings for communicating the coolant chamber with a beverage container in the inner container;

the outer container having an annular ledge around its upper end and the inner container having an annular flange around its upper end for resting on the ledge to hold the inner container in the outer container with its lower end spaced above the bottom of the outer container to allow coolant material in the coolant chamber to extend beneath the inner container;

the annular flange having a series of openings around its periphery for adding coolant material to the coolant chamber; and

a locking cap for locking the inner container in the outer container, having an annular flange with a downwardly depending skirt for engaging over the open upper end of the outer container, the flange having a central opening for alignment with the opening in the inner container when the cap is engaged on the outer container, and releasable means for releasably locking the cap on the outer container, the flange further having a drain opening for draining material from the coolant chamber and a removable cover for normally covering the drain opening.

4,638,646

HEAT STORING APPARATUS

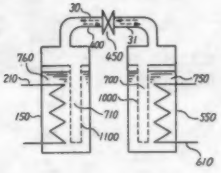
Yasuo Koseki, Hitachiohta; Akira Yamada, Hitachi; Hideki Kurokawa, Hitachi; Harumi Matsuzaki, Hitachi; Katsuya Ebara, Mito, and Sankichi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 825,877

Claims priority, application Japan, Feb. 4, 1985, 60-18557

Int. Cl.[4] F25B *17/02*

U.S. Cl. 62—478 **11 Claims**



1. A heat storing apparatus comprising:

(1) first container for a first medium which absorbs and desorbs a vapor component;

(2) second container for storing a second medium which absorbs and desorbs the vapor component;

(3) means for communicating said first and second storing means with a vapor-passage;

(4) first membrane means which is in contact with said first medium, for separating vapor of said vapor component and liquid in either of said first medium or second medium, or both;

(5) second membrane means which is in contact with said second medium, for separating the vapor of said vapor component and liquid in either of said first medium or second medium, or both; and

(6) means for supplying heat to said first medium so as to effect vaporization of said vapor component in said first medium, whereby only the vapor is transferred to said second medium through said first and second membrane means;

wherein said first medium and second medium have a boiling point higher than that of said vapor component.

4,638,647

METHOD AND FLAT WARP-KNITTING MACHINE FOR THE PRODUCTION OF A WEFT-AND-WARP-KNIT FABRIC

Dietmar Grenzendoerfer; Achim Wierzgon, both of Karl Marx Stadt; Gerhard Mueller, Garnsdorf; Dieter Erth, Gruena; Ludwig Guenther, Karl Marx Stadt, and Rolf Kuenzel, Gelenau, all of German Democratic Rep., assignors to VEB Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Filed Dec. 24, 1985, Ser. No. 813,319

Claims priority, application German Democratic Rep., Mar. 4, 1985, 273732

Int. Cl.[4] D04B *23/06*

U.S. Cl. 66—84 A **29 Claims**

1. In a method for the production of a warp-and-weft knit fabric comprising:

constantly guiding a continuous thread or yarn group in a weft yarn insertion device moving back and forth, the insertion device inserting the yarn group between a first weft yarn conveyor means and a second weft yarn conveyor means;

transferring a weft yarn group of the yarn group to the conveyor means and separating the weft yarn group from the insertion device and yarn group, whereby the weft yarn group has two free ends;

conveying the weft yarn group to a looping point; and

connecting the weft yarn group to loop-forming warp yarns

to form a fabric; the improvement comprising performing the following steps a plurality of times:

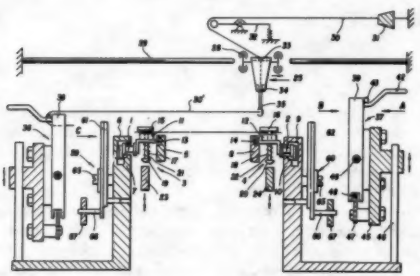
auxiliarily grasping and holding tightly, prior to transfer to the conveyor means, beginnings of the weft yarn group in a first weft yarn holding means;

auxiliarily grasping and holding tightly, prior to transfer to the conveyor means, the weft yarn group at a point other than the beginnings in a second weft yarn holding means;

separating the weft yarn group from the second weft yarn holding means and the insertion device in the vicinity of the second holding means after the weft yarn group being auxiliarily grasped and held tightly by the holding means has been transferred to the weft yarn conveyor means;

approximately simultaneously freeing the beginnings of the weft yarn group from the first weft yarn holding means;

transferring the weft yarn group being grasped and held



tightly by the second holding means to the first holding means, after the weft yarn group having free ends has been conveyed to the looping point, to auxiliarily grasp and hold the weft yarn group tightly in the first holding means and to form a new weft yarn group between the holding means;

transferring the new weft yarn group to the weft yarn conveying means;

separating the new weft yarn group from the first holding means and the insertion device in the vicinity of the first holding means after the new weft yarn group being auxiliarily grasped and held tightly by the holding means has been transferred to the weft yarn conveying means;

approximately simultaneously freeing the new weft yarn group from the second holding means; and

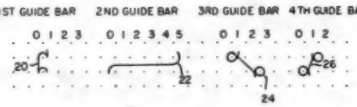
conveying the new weft yarn group to the looping point for connection to the loop-forming warp yarns.

4,638,648

LAYERED WARP KNITS

Bharat J. Gajjar, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1986, Ser. No. 858,142
Int. Cl.[4] D04B *23/08*
U.S. Cl. 66—193 **7 Claims**



1. In a knitted fabric that includes four (4) sets of threads knitted in a stitch pattern from first, second, third and fourth guide bars of a warp knitting machine forming spaced wales of knitted loops, the improvement comprising:

(a) first guide bar threads of continuous filament yarn partially threaded in the first guide bar with at least one end in and one end out and using a knit-in stitch pattern;

(b) second guide bar threads of a yarn having a denier at least twice that of the first guide bar yarn partially threaded in said second guide bar to duplicate the threading of the first guide bar and laid-in;

(c) third guide bar threads of continuous filament yarn fully threaded in said third guide bar using a knit-in stitch pattern; and

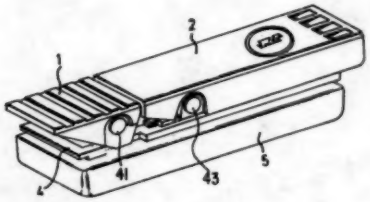
(d) fourth guide bar threads of elastomeric yarn fully threaded in said fourth guide bar using a knit-in stitch pattern.

4,638,649

DUAL ACTION LUGGAGE LATCH

Ting-Tsung Chao, Taipei, Taiwan, assignor to Echolac Co., Ltd., Taipei, Taiwan

Filed May 7, 1985, Ser. No. 731,283
Int. Cl.[4] E05B *65/52*; E05C *3/04*
U.S. Cl. 70—71 **9 Claims**



1. A latch for use in latching a hasp of a luggage case, said latch comprising a base having a first portion; a first actuating member rotatably mounted on said front portion of said base by a first pivot pin, said first actuating member including a front surface and outer and inner edges, said outer edge being movable in response to an external force applied to said outer edge to rotate said first actuating member in a first direction from a first position to a second position about said first pivot pin; a second actuating member rotatably mounted on said front portion of said base by a second pivot pin which is parallel to said first pivot pin, said second actuating member including a front surface, an inner edge disposed adjacent said inner edge of said first actuating member, and an outer edge which is movable in response to an external force applied to said outer edge, to rotate said second actuating member in a second direction opposite said first direction from a first position to a second position, said second actuating member being engageable with the hasp in said first position of said second actuating member and disengaged from the hasp in said second position of said second actuating member; and a sliding member mounted behind said first and second actuating members and slidable relative thereto between first and second positions associated with said first and second positions, respectively, of said first actuating member; said first actuating member including first displacement means for sliding said sliding member from its first position to its second position in response to rotation of said first actuating member from its first position to its second position; said sliding member including a stop which, in said first position of said sliding member, is positioned behind a portion of said second actuating member to prevent the latter from being rotated from its first position to tis second position, said stop being moved from behind said portion of said second actuating member when said sliding member is in its second position, to permit said second actuating member to be rotated to its second position.

4,638,650

ROTARY DRIVE LOCK

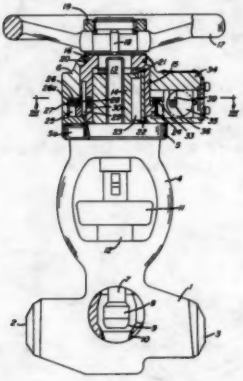
Carl H. Hafele, Bergstrasse 83, 4050 Monchengladbach 1, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,552

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333061

Int. Cl.[4] F16K *35/00, 31/44;* G05G *5/00*

U.S. Cl. 70—179 7 Claims



1. In An adjustable lock for rotating drives such as screw-down and gate valves wherein a casing for a locking mechanism extends around a driven rotating member of the drive, a locking sleeve corotates with the rotating member and its rotation is transmitted to a valve spindle or the like, and a lock bolt having a key-operable cylinder lock is movable between a locking position and a release position and adapted to locate the locking sleeve in a selected position, the improvement in said lock comprising:

an annular flange on the locking sleeve formed with peripherally-consecutive radial recesses which are open on at least one side of the flange,

at least two axially-contiguous, internally-toothed rings mounted to surround the locking sleeve adjacent the annular flange, one such ring comprising a guide ring which is stationary but adjustable, the other such ring comprising a control ring which is rotatable and differs in tooth number from the guide ring by at least one tooth,

a pinion engaging the internal tooth systems of the guide ring and control ring, the pinion being rotatable mounted on the locking sleeve and cooperating with the guide ring and control ring to form a planetary transmission,

said control ring being formed on its periphery with a single recess which is open on an end face of the control ring which engages the annular flange and which, when in registration with a radial recess in the annular flange, forms part of a combined recess of an opening of cross section such that the lock bolt can be introduced positively thereinto in the peripheral direction, and

outer toothing on the guide ring engageable by adjustable locking means for adjustment of the locking position of the lock.

4,638,651

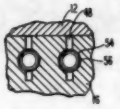
LOCK CYLINDER HAVING TWO SETS OF TUMBLERS AND KEY THEREFOR

Walter E. Surko, Jr., Southington, Conn., assignor to Yale Security Inc., Charlotte, N.C.

Filed Aug. 7, 1985, Ser. No. 763,205

Int. Cl.[4] E05B *27/02*

U.S. Cl. 70—364 A 15 Claims



1. In combination, a key having front and back surfaces and comprising a head and a blade, the blade having on its front surface along one longitudinal edge conventional edge bittings and along the opposite edge a side rail, the side rail having a contoured edge code, the edge code extending a substantial part of the length of the blade including a series of bittings defined by lines transverse of the blade and substantially parallel to the plane of the key, the blade having at its end farthest from the head a nose portion including an incline plane on the side rail tapering down from the front of the blade to meet the back of the blade in a fine edge; and lock cylinder receiving the key and comprising a housing having a cylindrical opening, a lock core in the cylindrical opening and formed with a keyway including a portion receiving the side rail, the core and the housing being provided with the conventional pin tumblers and pin tumbler openings above the keyway, the pin tumblers engaging the top edge bittings on the key, the core also formed with transverse slots intersecting the keyway, partial disc tumblers disposed in the respective slots, spring means urging the disc tumblers to a position with their ends disposed in the keyway, the disc tumblers being formed with gates on their outer periphery at selected points respectively, a side bar normally disposed partly in a recess in the core and also partly in a longitudinal groove in the housing at one side of the cylindrical opening, the groove having sloping walls, means urging the side bar outward, the side bar being cammed inward of the housing when the core is turned, such turning being made possible only provided the key is inserted in the keyway, said fine edge serving to wedge under the ends of the partial disc tumblers in insertion to move them, and the contoured edge code engaging the ends of the disc tumblers to position the disc tumblers with their gates in alignment with the side bar and thereby permitting the side bar to move inward totally into the recess in the core.

4,638,652

SEALING CAP

Milton Morse, Fort Lee, and John Morris, Oakland, both of N.J., assignors to Nena Morse, Fort Lee, N.J.

Filed Aug. 22, 1983, Ser. No. 525,442

Int. Cl.[4] E05B *17/18*

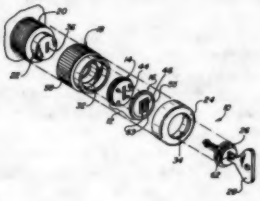
U.S. Cl. 70—454 35 Claims

1. A cover member comprising:

a circular member having outer and inner surfaces; and

a slit therein extending from the outer surface to the inner surface at an oblique angle of from about 25° to 45° from

the outer surface, the opening in the outer surface being substantially in the center of the surface; and



at least one plug and socket formed on the inner surface adapted to matingly engage a similar socket and plug of another cover member.

4,638,653

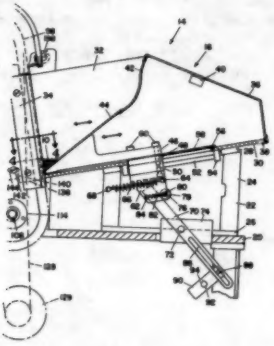
METHOD OF MANUFACTURING AND DELIVERING COIL SPRINGS

William H. Walsh, Marina del Rey, Calif., assignor to The Gillette Company, Boston, Mass.

Filed Dec. 18, 1984, Ser. No. 683,914

Int. Cl.[4] B21F *3/00, 11/00, 21/00, 35/00*

U.S. Cl. 72—129 **5 Claims**



1. A method of manufacturing delivering springs to a desired location at a desired spacing, comprising the steps of:

spirally forming a plurality of said springs by winding a plurality of closely wound coils on each end of said springs, said end coils being wound close enough to prevent tangling between springs and by winding a plurality of coils in a center portion having a spacing greater than said wound coils on said ends;

placing a plurality of said springs into parallely spaced bundles with the ends of said springs generally aligned;

placing said bundles of said generally aligned springs into a feedbox having an opened side;

passing a plurality of spring carrying platens over said opened side of said feedbox; and

urging said springs into grooves in said platens as said platens are passed over said opened side of said feedbox, wherein said springs are placed in a desired spacing and delivered from said feedbox by said platens.

4,638,654

DEVICE FOR CONTROL OF ROLL CAMBER IN A ROLLING MILL

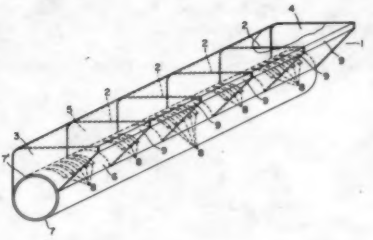
Maurizio Lubrano, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

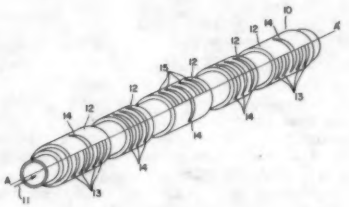
Filed Sep. 5, 1985, Ser. No. 772,722

Claims priority, application Italy, Sep. 25, 1984, 48902 A/84

Int. Cl.[4] B21B *27/10*

U.S. Cl. 72—201 **4 Claims**





1. Device for control of the camber of rolling mill rolls, by which cooling liquid is delivered onto the body of each roll involved, characterized by the fact that said device consists of an elongated, hollow-shaped distributor set with a major axis parallel to the body of the roll and divided internally into several non-intercommunicating chambers by means of dividers that are integral with the walls of said hollow body, said dividers being arranged transversely to said major axis of the distributor; a coolant supply manifold; each of said chambers having a number of adjustable-sized openings on one of its walls for the inflow of cooling liquid from said coolant supply manifold; said device being further provided with means for adjusting the size of said openings; and the distributor itself having upper and lower walls which converge toward the roll body and terminate a short distance therefrom as a narrow slit of uniform width parallel to the roll body and extending the whole length thereof.

4,638,655

HOLDING AND GUIDING A MANDREL ROD IN ROLLED STOCK IN AND ADJACENT TO A TUBE ROLLING MILL

Wilhelm Sebastian, Heiligenhaus; Wilhelm Nickel, Muelheim, and Klaus-Peter Schirmag, Ratingen, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,664

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345665

Int. Cl.[4] B21B *25/02*

U.S. Cl. 72—208 **2 Claims**

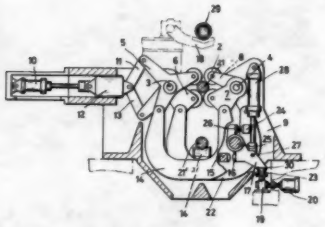
1. Device for holding a mandrel rod adjacent to a mill for rolling and for guiding the rolled stock, there being a rolling

axis and a delivery path for fresh mandrel rods being arranged in vertical alignment, comprising:

a basically U-shaped frame structure arranged on three sides of the rolling axis as well as of the mandrel rod delivery path, said frame structure being open on the fourth side to permit removal of a mandrel rod with rolled hollow thereon in the direction opposite the disposition of the mandrel rod delivery axis;

a first pair of levers arranged and mounted on the frame structure to one side of the rolling axis and respectively having guide elements, one of the guide elements being disposed above the rolling axis the other guide element being disposed below the rolling axis;

a second pair of levers arranged and mounted on the frame



structure to another side of the rolling axis each likewise having a guide element, one of guide elements of the second pair of levers being disposed above the rolling axis and the other one of the guide elements of the second pair of levers being disposed below the rolling axis;

a pair of U-shaped connecting elements interconnecting levers pertaining to different ones of said pairs such that a lever of one of the pairs having a guide element disposed above the rolling axis is connected to a lever of the other pair having a guide element disposed below the rolling axis; and

a common drive means connected to one of the pairs for moving all said levers in unison in between different positions in which the respective guide elements have different radial distances from said axis of rolling.

4,638,656

APPARATUS AND METHOD FOR CALIBRATING SPAN OF PRESSURE MEASURING INSTRUMENTS

George E. Sgourakes, Millis, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Oct. 17, 1984, Ser. No. 661,807

Int. Cl.[4] G01L *27/00*; G01K *11/00*

U.S. Cl. 73—4 R **34 Claims**

1. In a pressure measuring instrument of the type including a sealed interior pressure chamber containing a fill-liquid and having diaphragm means to apply thereto an input pressure signal to be measured, said instrument further including sensing means responsive to the input pressure signal applied to said fill-liquid to produce a corresponding output signal;

that improvement for calibrating the span of the instrument comprising:

reference pressure means forming in integral part of said instrument and including means in communication with said fill-liquid to apply thereto a reference pressure of precisely-controlled predetermined magnitude; and

said reference pressure means being activatable while said input pressure signal is stable to apply said reference pressure to said fill-liquid so as to produce from said sensing means an output signal corresponding to said reference pressure magnitude;

whereby the span of the instrument can be monitored and adjusted as necessary to assure that the output signal will correspond exactly to said reference pressure magnitude.

4,638,657

DEVICE FOR MEASURING THE WINDING HARDNESS OF A STRIP, ESPECIALLY A STRIP OF PAPER, WOUND INTO A REEL

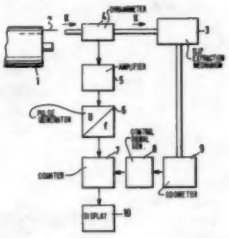
Gerhard Buschmann, Dusseldorf, and Georg Muller, Neuss, both of Fed. Rep. of Germany, assignors to Jagenberg Ag, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,761

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426301

Int. Cl.[4] G01N *3/00*

U.S. Cl. 73—78 **2 Claims**



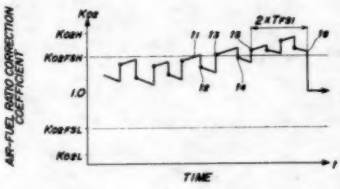
1. In a device for measuring the winding hardness of a strip wound into a reel with a plurality of coils, the device including a mechanism for extracting a slip of paper that has been inserted tightly between two coils of the reel of paper with one end extending out of the side of the reel and a dynamometer for measuring the force necessary to extract the slip over a certain distance, the improvement comprising: means for extracting the slip at a constant extracting speed; a pulse generator for producing counting pulses having a frequency proportional to the force measured by the dynamometer; an up-down counter receptive to the counting pulses; an odometer for detecting equal distances of movement of the slip; and means for switching the counter from up to down when a given distance is reached and stopping the counter when a distance equal to the given distance is again reached as detected by the odometer.

4,638,658

METHOD OF DETECTING ABNORMALITY IN A SYSTEM FOR DETECTING EXHAUST GAS INGREDIENT CONCENTRATION OF AN INTERNAL COMBUSTION ENGINE

Yutaka Otobe, Shiki, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Sep. 16, 1985, Ser. No. 776,466
Claims priority, application Japan, Sep. 19, 1984, 59-194586
Int. Cl.[4] G01M *15/00*; F02M *7/00*
U.S. Cl. 73—117.3 3 Claims



1. A method of detecting an abnormality in a system for detecting the concentration of an ingredient contained in exhaust gases emitted from an internal combustion engine, said system including sensor means for detecting the exhaust gas ingredient concentration, wherein a correction value for the air-fuel ratio of a mixture being supplied to said engine is set in response to an output signal from said sensor means, and the air-fuel ratio of said mixture is controlled in response to said correction value thus set, said correction value being applied in detecting said abnormality, the method comprising the steps of:

(1) setting a first predetermined value and a second predetermined value smaller than said first predetermined value, which values both lie within a first range defined by (i) an upper limit value of said correction value which is larger than said first predetermined value and (ii) a lower limit value of said correction value which is smaller than said second predetermined value, said upper limit value and said lower limit value being extreme values that can be assumed while said sensor means is functioning normally when said engine is in normal operating conditions;

(2) determining whether or not said correction value has continually been lying outside a second range defined by said first predetermined value and said second predetermined value over a limited period of time, said first range and said limited period of time being set at such values as to detect a change in output characteristics of said sensor means due to degradation in performance thereof; and

(3) providing a signal indicating that said system for detecting the exhaust gas ingredient concentration including said sensor means is abnormal if it is determined that said correction value has continually been lying outside said second range over said limited period of time at said step (2).

4,638,659

DEVICE FOR THE INDIRECT CONTACTLESS ELECTRICAL MEASURING OF SHORT PATHS

Edmund Schiessle, Schorndorf, and Werner Forkel, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,848
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343269
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A 15 Claims

10. A device for indirectly measuring a short distance, the device comprising:

a housing having a longitudinal axis,

a measurement coil assembly including a first coil having opposite ends, a companion first core of a soft-magnetic alloy, and a measurement face defined by one of the ends of the first coil,

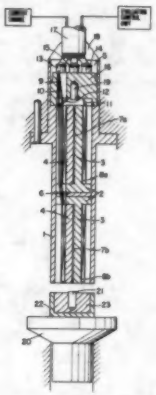
a control element including a permanent magnet and a measurement face defined by the permanent magnet,

means for supporting the control element for rectilinear movement along the longitudinal axis of the housing to present the measurement face of the control element in axially spaced confronting relation to the measurement face of the first coil such that movement of the permanent magnet in relation to the first coil causes a change in the magnetic flux density in the first core to effect a change in the dynamic permeability of the first core and thereby change the inductance of the coil,

means for detecting a change in the inductance of the first core to indicate the distance between the measurement face of the control element and the axially spaced apart measurement face of the first core,

a reference coil assembly including a second coil having opposite ends, a companion second core of a soft-magnetic alloy, and a reference face defined by one of the ends of the second coil, and

a reference magnet fixed in spaced-relation to the reference face of the second core to generate a certain magnetic flux density in the second core.

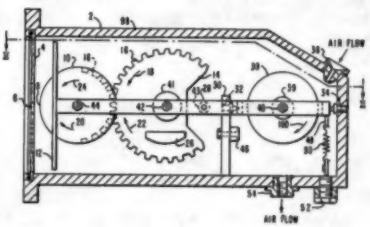


4,638,660

BASIC FLIGHT INSTRUMENT

Richard D. Henry, Box 331-A, Clinton, Pa. 15026

Filed Jan. 6, 1986, Ser. No. 816,453
Int. Cl.[4] G01C *21/00*
U.S. Cl. 73—178 R 5 Claims



1. A basic flight instrument comprising a vertical axis referenced rate gyro in combination with a display drum, said drum possessing a horizon demarcation line, wherein, by compara-

tive reference of said line to an aircraft silhouette etched into the glass display face of the basic instrument the pilot may determine roll and or pitch for determination of his or her flight situation, whereby, roll erection will be provided by a gimbal cage erection spring, said cage being 45 degree deflective limited and pitch erection accomplished by the drum rotation receiving reversal input from a lead weighted drive gear, said weight being responsive to the gravitational tug force of the earth, said display drum rotation will be pitch limited to a maximum of 45 degrees, whereby said basic instrument will be totally free of possible tumble.

4,638,661

APPARATUS FOR MEASURING THE VOLUME OF A MEASURING GAS

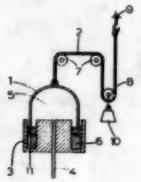
Anthony B. Bergmans, Bilthoven, Netherlands, assignor to Gould Electronics B.V., Netherlands

Filed Jun. 20, 1985, Ser. No. 747,065

Claims priority, application Netherlands, Jun. 28, 1984, 8402041

Int. Cl.⁴ G01F *3/34*

U.S. Cl. 73—237 **9 Claims**



1. An apparatus for measuring the volume of a gas comprising:

a stationary body having a circumferential channel for receiving a fluid;

a measuring bell movable upwardly and downwardly in vertical direction which is suspended into the circumferential channel so that a measuring space is formed between the measuring bell and the stationary body;

a measuring conduit extending axially through the stationary body wherein the conduit communicates at one end with the measuring space and at the other end with the gas to be measured;

a flexible cable for suspending the measuring bell into the circumferential channel which is fixed at one end to the top of the measuring bell and at the other end to a fixed point wherein the flexible cable passes over at least two guide rolls before it terminates at the fixed point;

a free pulley supported by the flexible cable between the at least two guide rolls and the fixed point end of the cable wherein the free pulley sits in a free hanging loop of the cable between the guide rolls and the fixed point; and

a balance weight supported by the free pulley having a weight sufficient to position the circumferential edge of the bell in the circumferential channel of the body but not in contact with the body.

4,638,662

TANK LEAKAGE DETECTOR

Edward P. Watson, Hamilton Square, N.J., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Nov. 12, 1985, Ser. No. 796,885

Int. Cl.⁴ G01F *23/00*

U.S. Cl. 73—302 **6 Claims**

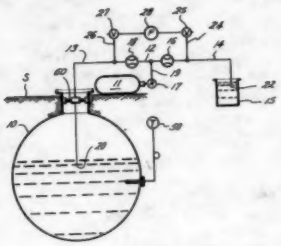
1. A method for detecting a change in the amount of liquid in a storage tank comprising the steps of:

(a) providing a source of gas at greater than atmospheric pressure;

(b) positioning a gas line communicating with said gas source in said storage tank, the end of said gas line being below the surface of the liquid;

(c) positioning a second gas line communicating with said gas source into a liquid filled cup, the end of said line being movable between a first position at the surface of the liquid and a second position below the surface;

(d) sensing the differential pressure between said first and second gas lines and adjusting said second position of said second gas line until said differential pressure is zero;



(e) computing the depth of the end of said first line from the observed depth of the end of said second line;

(f) holding said first gas line in fixed position for a predetermined time; and

(g) re-zeroing the differential pressure between said first and second lines after said predetermined time by repositioning the end of said second line and recalculating the depth of said first gas line.

4,638,663

LEVEL INDICATING DEVICE FOR LIQUID CONTAINERS

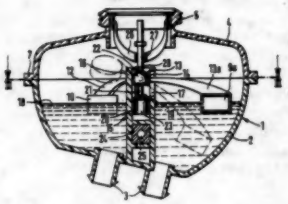
Gottfried Seelhorst, Dinklage, Fed. Rep. of Germany, assignor to Firma Riesselmann & Sohn, Lohne, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 807,809

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445475

Int. Cl.⁴ H01H *35/18*; G01F *23/36*

U.S. Cl. 73—313 **11 Claims**



1. A level indicating device for liquid containers comprising:

(a) a plurality of floats disposed on a single plane in said container;

(b) a plurality of lever arms, each lever arm supporting one of said floats;

(c) a guide maintained approximately centrally in said container and approximately vertically with respect to the surface of a liquid in said container when at rest;

(d) a union supported for free movement in said guide and to which each of said lever arms is connected; and

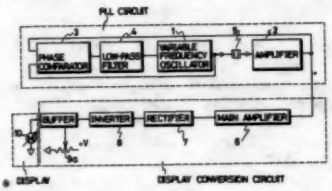
(e) said union operatively connected for coaction with means mounted for connection to a signal device to indicate at least one level of the liquid.

4,638,664

QUARTZ BAROMETER

Fujio Tamura, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 783,249
Claims priority, application Japan, Oct. 3, 1984, 59-207576
Int. Cl.[4] G01L *11/00*
U.S. Cl. 73—384 1 Claim



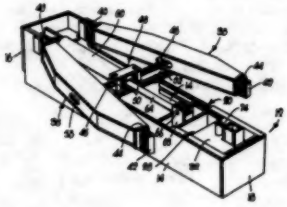
1. In a quartz barometer of the type which includes at least:
a phase locked loop circuit (PLL circuit) component consisting of a variable frequency oscillator, a phase comparator, a low-pass filter and an amplifier;
a quartz oscillator connected to said variable frequency oscillator;
a display conversion circuit portion connected to said PLL circuit portion; and
a display portion connected to said display conversion circuit portion;
and which measures the pressure of an environmental gas of said quartz oscillator from a resistance value at resonance or current value at resonance or voltage value at resonance of said quartz oscillator, the improvement wherein a temperature-dependent resistor having temperature characteristics opposite those of the resistance at resonance of said quartz oscillator and the resistance value thereof not dependent upon the ambient pressure of the gas is connected in series with said quartz oscillator.

4,638,665

TUBE BENDER

David A. Benson, Hutchinson, and Ray A. Dilts, Sedgwick, both of Kans., assignors to Full Vision, Inc., Newton, Kans.

Filed Oct. 3, 1985, Ser. No. 783,734
Int. Cl.[4] B21D *9/05*
U.S. Cl. 72—389 18 Claims



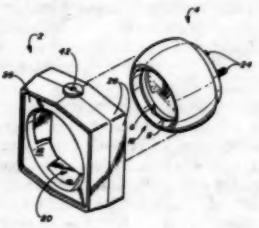
1. A tube bender comprising:
an enlongated, primary support;
a secondary support carried by the primary support for reciprocation longitudinally of the primary support;
power means interconnecting the supports for reciprocating the secondary support;
a die assembly carried by the secondary support for reciprocation therewith, said assembly including:
a pair of members disposed to receive a bendable tube therebetween,
a die between the members, presenting a core around which the tube is bent, and
releasable means for clamping the members against the tube; and
a pair of spaced anvils carried by the primary support within the path of travel of the tube against which the latter is pressed into shape.

4,638,666

MOVABLE GAUGE HOUSING

John K. Y. Wong, and Simon K. Y. Wong, both of Tainan Hsien, Taiwan, assignors to Lumen Electronics Corporation, Tainan Hsien, Taiwan

Filed Nov. 20, 1985, Ser. No. 800,511
Int. Cl.[4] G01D *11/24*
U.S. Cl. 73—431 16 Claims



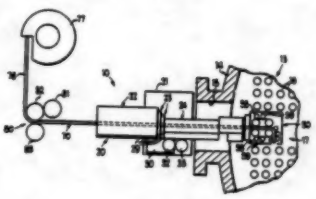
1. An automotive gauge housing providing a viewing surface with one or more openings therein for retention and movement of one or more gauges comprising:
(a) a housing with at least one circular opening extending through the interior of said housing, said opening framed therewithin by a plurality of concave supporting members; and
(b) at least one spherical gauge body having a gauge face; wherein said supporting members conform to and retain said gauge body while allowing said said gauge body to be freely revolvable within said housing.

4,638,667

REMOTE PROBE POSITIONING APPARATUS

John J. Zimmer, Turtle Creek, and Richard G. Soltesz, Gibsonia, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,498
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—432.1 1 Claim



1. Apparatus for positioning a probe within an enclosure defined by a vessel wall from outside the wall through an opening therein, said apparatus comprising: an elongated extensible boom having a longitudinal axis, said boom having an end adapted for longitudinal extension into and retraction from the enclosure through the opening therein; boom drive means coupled to said boom for effecting extension and retraction thereof; an elongated carrier extending along said boom from

outside the vessel wall, said carrier being relatively rigid in the directions of its length and width and being relatively flexible in the direction of its thickness; feed means on said boom adjacent to said end thereof for longitudinally feeding said carrier from said boom independently of the movement of said boom in a feeding direction into the enclosure orthogonal to said axis, said feed means including means for deflecting said carrier into a path angularly disposed with respect to said axis, and tractor means engageable with said carrier for feeding said carrier in said feeding direction through said deflecting means; withdrawal means disposed outside the vessel wall for moving said carrier longitudinally in a withdrawing direction opposite to said feeding direction independently of the movement of said boom; a probe supported by said carrier at one end thereof; swivel means including an internally-toothed ring gear fixedly mounted on said feed means, and a drive gear mounted on said boom and disposed in meshing engagement with said ring gear, said swivel means effecting bidirectional rotational movement of said feed means about an axis parallel to said longitudinal axis thereby to permit positioning of said probe, first measuring means for measuring the movement of sais boom; second measuring means for measuring the movement of said carrier with respect to said boom, each of said first and second measuring means including a rotary resolving means for converting a linear distance into a corresponding rotational angle, said second measuring means including two measuring devices respectively associated with said feed means and said withdrawal means for respectively measuring movement of said carrier in said feeding direction and said withdrawing direction; third measuring means for measuring the angle through which said feed means is rotated by said swivel means; and a microcomputer system for processing the measurements of said first and second and third measuring means for accurately determining the position of said probe within the enclosure.

4,638,668

MEASUREMENT COUPLING FOR FLUIDIC SYSTEMS

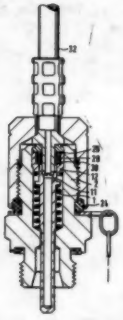
Siegfried Leverberg, Oberhausen, and Manfred Hofmann, Altendiez, both of Fed. Rep. of Germany, assignors to Hydrotechnik GmbH, Limburg, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,640

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341860

Int. Cl.[4] G01D *21/02*; G01L *19/00*; G01K *1/14*

U.S. Cl. 73—866.5 **18 Claims**



1. A measurement coupling for taking working pressures and temperatures of fluid media in fluid systems, comprising:

a coupling bushing under duct pressure in the built-in state;

a support ring and an O-ring arranged in a widened portion of an internal bore of a hollow guide insert arranged within a bore of said coupling bushing;

a spring-loaded and mechanically actuatable check valve arranged within the bore of said coupling;

said check valve including a valve body exhibiting a valve body cylindrical bore and a closed bottom face; said valve body having an end exhibiting said closed bottom face and which faces the fluid system and is prolonged beyond the coupling bushing; and

a radial transverse bore located in a wall of the valve body.

4,638,669

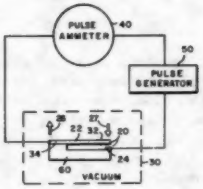
QUANTUM TUNNELING CANTILEVER ACCELEROMETER

Stephen Y. Chou, Stanford, Calif., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 7, 1985, Ser. No. 731,715

Int. Cl.[4] G01P *15/08*

U.S. Cl. 73—517 R **10 Claims**



1. An accelerometer comprising;

a vacuum chamber;

an electrode fixed in position within said vacuum chamber;

a cantilevered electrode located within said vacuum chamber having a fixed end and a free end, the free end of said cantilevered electrode being aligned with and separated from said fixed electrode such that acceleration of said accelerometer causes the free end of said cantilevered electrode to move towards said fixed electrode;

means for providing a voltage pulse across said fixed electrode and said cantilevered electrode; and

means for measuring the current flow caused by said voltage pulse, the amount of acceleration being determinable from the current measurement.

4,638,670

APPARATUS FOR THE DETERMINATION OF THE DISTANCE TRAVELED BY A PISTON IN A CYLINDER

Bernd Moser, Hamm/Sieg, Fed. Rep. of Germany, assignor to Boge GmbH, Eitorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 653,930, Sep. 24, 1984, Pat. No. 4,587,850, which is a continuation-in-part of Ser. No. 621,075, Jun. 15, 1984, Pat. No. 4,577,509. This application Aug. 16, 1985, Ser. No. 766,871

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430045

Int. Cl.[4] G01R *27/26*

U.S. Cl. 73—658 **20 Claims**

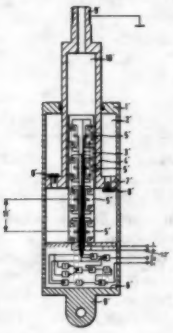
1. Apparatus for a cylinder assembly, said apparatus being for determining location of piston means in a cylinder means of said cylinder assembly, said piston means having a predetermined range of movement, said apparatus comprising:

semiconductor means including a plurality of semiconductor elements, said plurality of semiconductor elements being sensitive to predetermined electric fields and having a predetermined range of displacement substantially related to said movement range of said piston means;

electric field generating means for generating said predetermined electric fields to which said plurality of semiconductor elements are sensitive, said electric field generating means having means for connection to a first source of predetermined electrical potential, whereby at least one portion of said cylinder assembly is maintained in opera-

tion at a predetermined electrical potential, said predetermined electrical potential being determined by said said first source of predetermined electrical potential;

said semiconductor means having means for connection to a second source of predetermined electrical potential, said second source of predetermined electrical potential having a different electrical potential than said first source of predetermined electrical potential; and



said semiconductor means being disposed with respect to said cylinder assembly such that said predetermined electrical potential of said at least one portion of said cylinder assembly generates said predetermined electric field and actuates, in operation, at least one of said plurality of semiconductor elements in said predetermined range of movement of said piston means with said cylinder means, whereby said location of said piston means within said cylinder means is determined.

4,638,671

CHECKER FOR AIR CONDITIONER

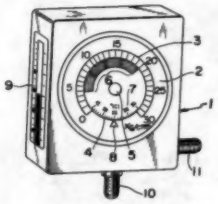
Yoshinori Yamamoto, Urayashu, Japan, assignor to Daikyo Service Station Development Co. Ltd., Japan

Filed May 24, 1985, Ser. No. 738,011

Claims priority, application Japan, Jun. 1, 1984, 59-80446[U]

Int. Cl.[4] G01L *19/04*

U.S. Cl. 73—708 **2 Claims**



1. A device for checking an air conditioner, the air conditioner including coolant for circulation therein, a coolant charge hose and a coolant pressure hose device comprising;

A pressure gauge having a pressure gauge indicator, movable in a circular path on a circular dial plate which has an annularly extending pressure indicating scale;

A circulator or auxiliary dial plate engagable over the circular dial plate of the pressure gauge and having a temperature correction gradution along its edge on the one side and an indicator zone along its edge on a diametrically opposite side from said graduation with a plurality of gas charge operating conditions indicated thereon, said operating range conditions and said temperature graduation corrections being arranged so that when the ambient temperature indication is aligned with a reference mark the pressure gauge needle will be positioned in an appropriate operating indicating range.

Finger piece means, associated with said auxiliary dial plate and coaxial therewith, for manual rotational manipulation of said auxiliary dial plate and for selecting an appropriate ambient temperature indication on said temperature correction graduation; first hose connection means for connecting the air conditioner coolant pressure hose to said pressure gauge; and,

second hose connection means for connecting the air conditioner coolant charge hose to said device and for effecting a charging of the coolant gas when said pressure gauge needle is positioned in an inappropriate operating indicating range.

4,638,672

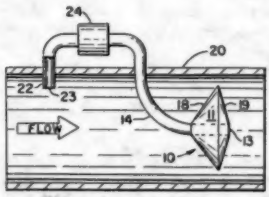
FLUID FLOWMETER

Floyd McCall, Hemet, Calif., assignor to Ametek, Inc., New York, N.Y.

Filed Sep. 11, 1984, Ser. No. 649,512

Int. Cl.[4] G01F *1/40*

U.S. Cl. 73—861.52 **11 Claims**



1. Apparatus for measuring fluid flow through a conduit, comprising:

(a) A fluid flow displacement member mounted in said conduit and having sloped wall means for deflecting the fluid to flow through a region defined by the periphery of said fluid displacement member and the interior surface portion of said conduit proximate said periphery, said slope wall means being effective to substantially linearize the velocity profile of said fluid in at least said region over a predetermined range of fluid flow rates through said conduit;

(b) conduit means extending transversely through said displacement member for diverting a portion of the fluid passing through said conduit along an auxiliary flowpath having one end positioned upstream of said fluid displacement member and its opposite end positioned downstream of said region; and

(c) totalizer means in said auxiliary flowpath for determining the total fluid flow therethrough.

4,638,673

METHOD AND APPARATUS FOR DETERMINING THE TORQUE OF A TORQUE GENERATOR

Felix Blaschke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 733,302

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418617

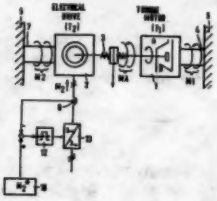
Int. Cl.[4] G01L *3/22*

U.S. Cl. 73—862.17 **7 Claims**

1. A method for determining the torque of a torque generator coupled to an electrical drive with a controllable electrical torque wherein the torque generator torque interchanged with

the drive ("interchange torque") is being measured, comprising:

determining a model value for the internal torque in accordance with a functional relationship which determines the internal torque of the torque generator as a function of the electrical torque, the interchange torque (MA) and the moments of inertia of the torque generator and drive, based on the electrical torque, the measured value of the



interchange torque, and a parameter for the moments of inertia;

calibrating the parameter for the moments of inertia to a minimal dependency of the model value on the variation of the electrical torque by varying the electrical torque, and

registering the model value as the value of the internal torque.

4,638,674

SAMPLE-COLLECTING DEVICE FOR GASEOUS OR VAPOROUS CONDENSABLE RADIOACTIVE SUBSTANCES, ESPECIALLY FOR COLLECTING TRACES OF TRITIUM

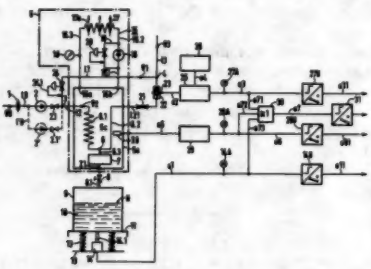
Eckhard Redmann, Frankfurt, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,634

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321063

Int. Cl.⁴ G01N *1/24*

U.S. Cl. 73—863.12 **11 Claims**



1. A sample collecting system for collecting gaseous or vaporous condensable radioactive substances in air from a nuclear installation which will operate over an extended monitoring period with no or few disturbances, and in the event that a disturbance occurs, gives at least one trouble signal, which comprises

(a) a fine filter through which a gas stream of air containing gaseous or vaporous condensable radioactive substances passes for removal of entrained particles suspended in the gas stream

(b) at least one suction branch line into which the filtered gas stream flows

(c) a measuring gas pump in the suction branch line propelling the gas stream from the suction branch line through a precipitate line enclosed in a measuring gas cooler, said precipitate line extending downwardly in the measuring gas cooler, at least partially as a helical coil for condensing the condensable radioactive substances together with H_2O if present and aiding in separating the condensate from the uncondensed gas in the gas stream

(d) a condensate collecting point at about the lowest point of the precipitate line for discharge of the condensate from the precipitate line

(e) a rising gas branch from the condensate collecting point upwards and then out of the measuring gas cooler for conducting the uncondensed gas from the condensate collecting point

(f) a measuring gas choke in the measuring gas line for determining the flow resistance in that line, followed by a transducer which aids in controlling the gas mass flow, and following the transducer, the gas therefrom is returned to the source from which the gas stream for sampling was withdrawn

(g) a pressure measuring line with a pressure difference control valve from the output of the flow transducer to the input of the precipitate line for regulating the measuring gas pressure of the measuring gas pump at the input of the precipitate line

(h) at least one temperature sensor in the measuring gas cooler and temperature indicating means outside the measuring gas cooler for ascertaining the temperature and indicating if an upper temperature is exceeded

(i) a fine separator system into which the condensate from the collecting point at the low point of the precipitate line flows

(j) a condensate line with a drain valve through which the condensate from the fine separator system discharges

(k) a condensate collecting tank located underneath the fine separtor system and into which the condensate from the condensate line flows, said tank also acting in determining the liquid level therein.

4,638,675

LIQUID SAMPLING SYSTEM

William A. Sperinck, Warrington, and Michael J. Hall-Wilton, Capenhurst, both of England, assignors to British Nuclear Fuels plc, Warrington, England

Filed Feb. 25, 1985, Ser. No. 704,597

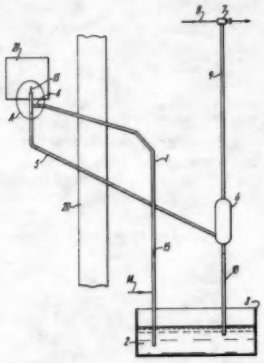
Claims priority, application United Kingdom, Mar. 9, 1984, 8406209

Int. Cl.⁴ G01N *1/14*

U.S. Cl. 73—864.34 **5 Claims**

1. A sampling system for obtaining representative samples from a bulk liquid comprising a first pipe arranged to be immersed at its lower end in the liquid, a needle sampling station at the opposite end of the pipe, a return flow pipe from the sampling station, means for maintaining a depression in the pipes and at the sampling station, a pulsed pressure fluid means communicating with the first pipe for lifting slugs of liquid to the sampling station, a needle at the sampling station and a bottle for receiving sample cooperable with the needle such

that with the bottle located on the needle the bottle is evacuated by the depression at the sampling station to allow liquid to



collect in the bottle and on removal of the bottle the depression prevents escape of liquid at the needle.

4,638,676

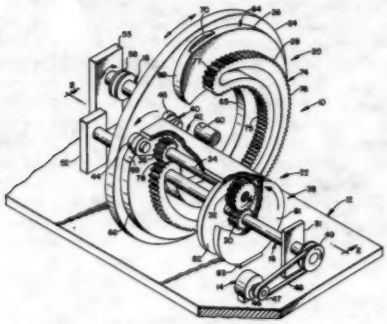
RECIPROCATING DRIVE MECHANISM WITH POSITIVE PINION-TO-RACK GEAR ENGAGEMENT

Gordon R. Lively, Longview, and Jerry M. Lang, Lindale, both of Tex., assignors to Rota-Flex Corporation, Longview, Tex.

Filed Feb. 25, 1985, Ser. No. 704,923

Int. Cl.[4] F16H *21/16, 19/08*

U.S. Cl. 74—31 **14 Claims**



1. A reciprocating drive mechanism powered by a rotating prime mover, the combination comprising:

a base;

an output shaft rotatably coupled to said base;

a wheel rigidly coupled to said output shaft;

an arcuate cam rigidly coupled to said wheel and having an endless cam track;

an arcuate rack gear rigidly coupled to said wheel and having an endless gear track with arcuate opposite ends;

an input shaft coupled to said base for rotation, coupled to said rotating prime mover for rotation therewith and having a driving gear rigidly coupled thereto;

a transmission shaft positioned parallel to said input shaft;

a driven gear rigidly coupled to said transmission shaft, engaging said driving gear and being rotated by said driving gear;

a pinion rigidly coupled to said transmission shaft and engaging said endless gear track;

a first rigid support rotatably receiving said input shaft and said transmission shaft therein and maintaining said input shaft and said transmission shaft at a fixed distance apart;

a second rigid support rotatably receiving said transmission shaft therein and having first and second cam followers rotatably coupled thereto and rotatably engaging said endless cam track; and

a third rigid support rigidly interconnecting and coupled to said first and second supports,

whereby rotation of said input shaft rotates said driving gear, which in turn rotates said driven gear, transmission shaft and pinion, and

whereby rotation of said pinion reciprocates said arcuate rack gear, wheel and output shaft as said pinion traverses the entire extent of said endless gear track,

said pinion walking around said endless gear track at said arcuate opposite ends thereof as said driven gear travels partially around said driving gear,

said endless gear track being located inside said endless cam track,

said first and second cam followers and said transmission shaft having parallel central axes,

the central axes of said transmission shaft, said first cam follower, and said second cam follower defining the three points of a triangle in end view.

4,638,677

INTERMITTENT DRIVE MEMBER

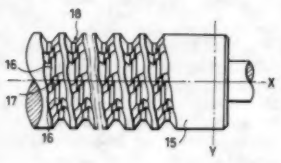
Takamichi Fuke, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 12, 1984, Ser. No. 650,401

Claims priority, application Japan, Sep. 12, 1983, 58-140169[U]

Int. Cl.[4] F16H *25/20, 55/02*

U.S. Cl. 74—84 R **4 Claims**



1. In an intermittent drive mechanism of the type comprising a shaft rotatable about an axis, a spiral groove formed in the outer peripheral surface of the shaft leading in one axial direction, and a tip end portion of a movable member riding in the spiral groove, the sprial groove having a plurality of groove portions positioned offset in stepwise axial increments along the sprial groove, each groove portion having a bottom wall formed at a predetermined depth and inclined side walls opposing each other on each side of the bottom wall such that the tip end portion of the movable member can ride along the bottom wall of the groove guided by the inclined side walls, the tip end portion being intermittently driven in stepwise axial increments along the one axial direction as it rides along successive groove portions of the spiral groove in conjunction with rotation of the shaft,

the improvement comprising:

each groove portion having a linear bottom wall extending in a direction transverse to said axis of said shaft, a leading side wall on the side leading in said axial direction, and a trailing side wall on the opposite side trailing in said axial direction;

each groove portion alternating with a chamfered portion leading from a preceeding groove portion to a next groove portion, each chamfered portion having opposing leading and trailing side walls for guiding the transition of said tip portion from the preceeding groove portion to the

next groove portion, each side wall of said chamfered portion extending from an end of a side wall of the preceeding groove portion to a beginning of a side wall of the next groove portion;

the leading side wall of each chamfered portion being positioned to overlap along said axis with the end of a trailing side wall of the preceeding groove portion;

the beginning of the leading side wall of the next groove portion also being positioned to overlap along said axis with the end of the trailing side wall of the preceeding groove portion; and

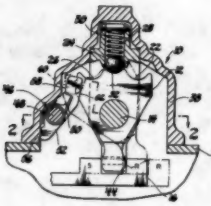
the trailing side wall of each chamfered portion being positioned to overlap along said axis with the beginning of a leading side wall of the next groove portion.

4,638,678

MANUAL TRANSMISSION SHIFT CONTROL MECHANISM HAVING A REVERSE INHIBITOR

Michael J. Gorman, Madison Heights, and William R. McClellan, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 30, 1985, Ser. No. 781,340
Int. Cl.[4] F16H 57/06
U.S. Cl. 74—476 2 Claims



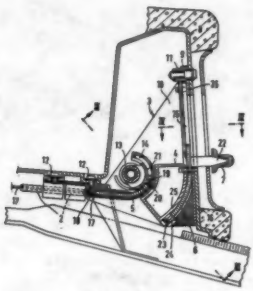
1. A control mechanism for a manually shifted transmission including an inhibitor mechanism which prevents direct shifting from the highest forward speed ratio to the reverse speed ratio, the transmission having a neutral condition, a plurality of forward speed ratio positions including a highest ratio and a lowest ratio and a reverse ratio position, said control comprising; a housing; selector lever means movable linearly along a selector axis in the neutral condition between preselecting conditions for each of the forward speed ratio positions and the reverse speed ratio position and being rotatable about the selector axis from the neutral condition to a select position for the desired speed ratio; and reverse inhibitor means including a support pin secured in said housing and defining an inhibitor axis parallel to and offset from the selector axis, inhibitor lever means having two abutment pads and being slidably and rotatably disposed on said support pin and spring means for simultaneously urging said inhibitor lever means linearly and rotatably to one position to force one of the abutment pads into abutment with said housing to position a portion of the inhibitor lever means in linear alignment with said selector lever means, said selector lever means moving said inhibitor lever means linearly against said spring means when said selector lever means is moved in the neutral condition to the preselection condition for the highest speed ratio position and the reverse speed ratio position, said selector lever means moving out of linear alignment and out of physical contact with said inhibitor lever means when the highest forward speed ratio position is selected by pivotal movement of said selector lever means, said spring means returning said inhibitor lever means to said one position when said highest forward speed ratio position is selected to align said inhibitor lever means with the path of pivotal movement of said selector lever means, said selector lever means contacting and pivoting said inhibitor lever means upon pivoting of said selector lever means from the highest forward speed ratio position to the highest ratio neutral preselecting condition and said inhibitor lever means pivoting against said spring means until the other of said abutment pads contacts with said housing to prevent further pivoting of said selector lever means toward said reverse speed ratio position prior to linear movement of said selector lever means in the neutral condition toward said lowest forward speed ratio preselecting condition.

4,638,679

ADJUSTING MECHANISM FOR A BOWDEN CABLE

Gerd Tannenlaufer, Remscheid, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed May 17, 1984, Ser. No. 611,458
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321187
Int. Cl.[4] F16C 1/10
U.S. Cl. 74—501 R 3 Claims



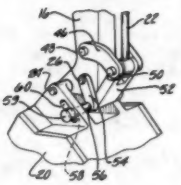
1. An adjusting mechanism for a Bowden cable having an outer sleeve and an inner cable comprising a casing connected to the sleeve, a first flexible push and pull element carried for guided movement with respect to the casing and connected to the inner cable, a first arcuate guide carried with the casing for guidingly receiving the first push and pull element, a lever arm pivotally mounted with respect to the casing and connected to the first push and pull element, a second flexible push and pull element connected to the lever arm, and a second arcuate guide carried with the casing and having a straight section and receiving the second push and pull element to permit movement of the second push and pull element in response to movement of a control knob connected thereto along a substantially linear path.

4,638,680

BUCKET LINKAGE

Allan Albrecht, Rothschild, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 22, 1985, Ser. No. 768,260
Int. Cl.[4] G05G 1/04
U.S. Cl. 74—516 2 Claims



1. An attaching means for attaching a bucket to a boom arm

for rotation about said arm between a first position and a second position, said attachment means comprising:

an offset hinge point on said arm positioned a predetermined distance from the longitudinal center line of said arm;

said bucket pivotally connected to said offset hinge point such that said bucket is rotatable about said arm; and

a linkage system interconnecting said bucket to said arm, said system having a continually adjustable power point that automatically reduces the radius of bucket rotation as measured between said power point and said hinge point as said bucket rotates from said first position to said second position, thereby providing increased power at said first position and continually increasing the bucket speed as said bucket rotates to said second position; and said linkage system further comprising:

a first link pivotally connected at one end to said arm adjacent said offset, a second link pivotally connected at one end to said arm a spaced distance from said first link, and a third link pivotally interconnecting the opposite ends of said first and second links;

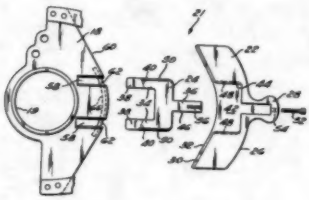
said first and third links connected by a pin which is received by and moveable within a slot formed in said bucket thereby forming said continually adjustable power point.

4,638,681

REPLACEMENT LEVER

John D. Eldridge, Jr., Newport Beach, Calif., assignor to Jodel Associates, Inc., Newport Beach, Calif.

Filed Aug. 19, 1985, Ser. No. 767,139
Int. Cl.[4] G05G *7/12*
U.S. Cl. 74—544 **14 Claims**



1. A replacement control lever for attachment to a movable member behind a slot in an automobile dashboard, without removing said dashboard, said lever comprising:

a main lever body having a knob for manipulating the lever within the slot in the dashboard;

an insert member for securing said main lever body to said movable member; and

means for adjustably fastening said insert and said main lever body together from the front of the dashboard, said fastening means drawing said insert member toward said main lever body to clamp said movable member between the insert member and the main lever body, to allow installation of said lever without removal of the dashboard.

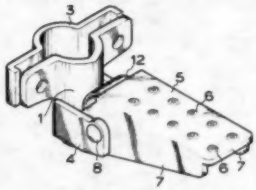
4,638,682

AUXILIARY PEDAL DEVICE FOR TRICK-CYCLING ATTACHED TO THE FRONT FORK BLADE OF A BICYCLE

Hisao Michiyama, No. 48-1, Yahiro 2-Chome, Sumida-Ku, Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,960
Claims priority, application Japan, Jun. 19, 1985, 60-91544[U]
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—560 **3 Claims**

1. An auxiliary pedal device for trick-cycling attached to a front fork blade of a bicycle, comprising a pedal, a plate spring, and a pair including a fixture and a counterpart fixture, said fixture being adapted to be attached to the front fork blade of the bicycle together with said counterpart fixture by bolts and nuts and provided with a pair of parallel brackets positioned at both sides of a lower portion of the fork blade, said brackets protruding from the fork blade in two opposite directions, said pedal having an upper face and being provided with a pair of side plates positioned at both sides thereof, said side plates being inserted between said brackets, a supporting shaft fixed



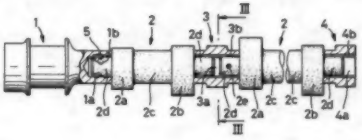
to the brackets and rotatably supporting said plates, said brackets having a pair of stopper pawls which are outwardly extending from said brackets, said fixture having a hole and a lower edge, said pawls being engaged with said lower edge, said plate spring having a first end portion engaged in said hole of said fixture, a second end portion supported on said shaft, and an intermediate portion which is circularly bent to engage and push up an underside of said pedal.

4,638,683

CAMSHAFT FOR ENGINE

Yutaka Ogawa; Takayuki Ogasawara, and Yoshiaki Hori, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 10, 1985, Ser. No. 742,915
Claims priority, application Japan, Jun. 18, 1984, 59-124762
Int. Cl.[4] F16H *53/00*
U.S. Cl. 74—567 **19 Claims**



1. A camshaft having a plurality of cams disposed on a metal shaft in a spaced-apart relationship with each other in an axial direction on the shaft, wherein the improvement comprises:

at least one ceramic cam portion comprising a ceramic material, each of said at least one ceramic cam portion having a pair of joining protrusions which extend from opposite axial ends thereof in said axial direction of the metal shaft; and

a plurality of metallic shaft portions separated from each other by said at least one ceramic cam portion, each of said metallic shaft portions including joining holes which engage said joining protrusions of said at least one ceramic cam portion, such that said at least one ceramic cam portion is joined integrally to said metallic shaft portions.

4,638,684

ASSEMBLY FOR TAKING UP AND COMPENSATING FOR TORQUE-INDUCED SHOCKS

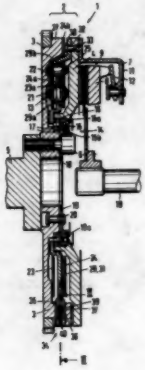
Paul Maucher, Sasbach, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 661,028

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1983, 3338574; Mar. 5, 1984, 3410367

Int. Cl.[4] F16D *43/04*

U.S. Cl. 74—574 **26 Claims**



1. An assembly for taking up and compensating for torque-induced shocks, especially for taking up and compensating for fluctuations of torque which is transmitted by an internal combustion engine to a change-speed transmission in a motor vehicle, comprising a flywheel including coaxial first and second parts mounted for rotation at a variable speed and for limited angular movement relative to each other, one of said parts being arranged to receive torque from the engine and the other of said parts being arranged to transmit torque to the input element of the transmission; damping means operative to resist said relative angular movement; and means for regulating the resistance to rotation of said parts relative to each other so that such resistance decreases with increasing rotational speed of said parts.

4,638,685

ORTHOPAEDIC SAFETY STRAP SUITABLE FOR BICYCLE PEDALS

Flavio Cigolini, Via Martinengo 22506 Sant'Andrea di Concesio, Brescia, Italy

Filed Dec. 13, 1984, Ser. No. 681,128

Claims priority, application Italy, Dec. 14, 1983, 5235 A/83; Mar. 23, 1984, 5133 A/84

Int. Cl.[4] G05G *1/14*

U.S. Cl. 74—594.6 **4 Claims**

1. An orthopaedic safety strap which, in use, is passed through slits in a bicycle pedal and over the cyclist's foot to bind the cyclist's foot on the pedal and in a toe-piece, said orthopaedic safety strap comprising:

(a) a first elongated tape comprising:

(i) a first portion sized and shaped to pass through the slits in a bicycle pedal;

(ii) a second portion connected to said first portion, said second portion being substantially broader than said first portion and being sized and shaped to provide orthopaedic lateral support to the cyclist's foot;

(iii) a third portion connected to said second portion, said third portion being substantially narrower than said second portion and being sized and shaped to be received in and held by a buckle (to be recited); and

(iv) a plurality of first snaps mounted on said first portion;

(b) a second elongated tape comprising:

(i) a first portion sized and shaped to pass through the slits in the bicycle pedal;

(ii) a second portion connected to said first portion, said second portion being substantially broader than said first portion and being sized and shaped to provide orthopaedic lateral support to the cyclist's foot;

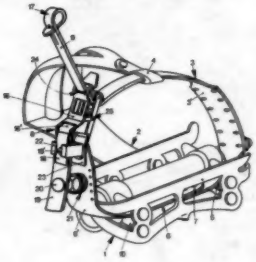
(iii) a plurality of second snaps mounted on said first portion, said plurality of second snaps being sized, shaped, and positioned so that a selected one of said first snaps can be engaged with a selected one of said second snaps, permitting the size of the orthopaedic safety strap to be adjusted to the size of the cyclist's foot;

(c) a clip attached to the end of said second elongated tape remote from said first portion of said second elongated tape;

(d) a buckle attached to said clip, said buckle comprising:

(i) a roller about which said third portion of said first elongated tape is passed during use of the orthopaedic safety strap;

(ii) a swinging element that is pivotally mounted on said clip for movement between a first position and a second position, said swinging element containing a throughhole lined with detents, said swinging element, said throughhole, and said detents being sized, shaped, and positioned so that, when said swinging element is in its first position and said third portion of said first elongated tape is passed around said roller and through said throughhole, said detents engage said third portion of said first elongated tape and bind the cyclist's foot on the pedal and so that, when said swinging element is in its second position, said detents release said third portion of said first elongated tape; and



(iii) a balancing element connected to said swinging element such that movement of said balancing element from a first position to a second position causes said swinging element to move from its first position to its second position; and

(e) a button for the automatic release of the orthopaedic safety strap, said button comprising a first element mounted on said second portion of said second elongated tape, a second element mounted on said balancing element in position to releasably engage said first element, and a spring resiliently biasing said balancing element away from said second portion of said second elongated tape, said first and second elements being designed to release engagement in response to lateral movement of the cyclist's foot against said first element,

whereby, when the cyclist moves his foot laterally against said second portion of said second elongated tape, said first and second elements of said button disconnect, said spring forces said balancing element from its first position to its second position, the movement of said balancing element from its first position to its second position moves said swinging element from its first position to its second position, said detents release said third portion of said first

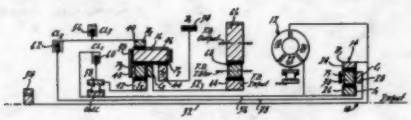
elongated tape, and the bicyclist can quickly and safely remove his foot from the toe-piece.

4,638,686

TRANSAXLE FOR A VEHICLE DRIVELINE

George E. Lemieux, Livonia; Reginald T. Lewicki, Dearborn Heights, and Julius A. Clauss, Birmingham, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 26, 1980, Ser. No. 134,240
Int. Cl.⁴ F16H *47/08*
U.S. Cl. 74—688 **1 Claim**



1. A transaxle for delivering torque from a driving member to a pair of driven members comprising a compound planetary gear unit, a hydrokinetic unit, a differential gear unit and a planetary gear torque splitter unit, the hydrokinetic unit and the planetary gear unit being assembled on a first axis;

a transaxle housing having a first housing portion enclosing said hydrokinetic unit and said torque splitter unit and having an opening at one side of said first housing portion whereby said hydrokinetic unit and said torque splitter unit may be assembled therethrough;

a second housing portion enclosing said compound planetary gear unit and having an opening at the side of said second housing portion opposite to said one side whereby said planetary gear unit may be assembled therethrough;

a housing wall adapted to close the opening in said second housing portion following assembly of said planetary gear unit;

a third housing portion enclosing said differential gear unit and having an opening in the lower side of said third housing portion whereby said differential gear unit may be assembled therethrough;

an oil pan covering the opening in said third housing portion;

said third housing portion being situated with respect to the axis of said hydrokinetic unit between said first and second housing portions and laterally offset therefrom;

said torque splitter unit having a torque input element and two torque output elements;

said hydrokinetic unit having an impeller connected to said torque input element and a turbine connected to one of said torque output elements;

a pair of concentric torque delivery shafts, one torque delivery shaft being connected to one of said torque output elements and the other being connected to the other torque output element;

said compound planetary gear unit having first and second sun gears, first and second planet gear sets mounted on a common carrier and engaging each other, said first sun gear engaging said first planet gear set and said second sun gear engaging said second planet gear set, and a ring gear engaging said first planet gear set;

a final drive input gear connected to said common carrier and a final drive output gear connected to an input side of said differential gear unit;

first brake means for selectively braking said first sun gear during low and intermediate drive operation;

first clutch means for connecting said one torque delivery shaft to said second sun gear;

second clutch means for connecting said other torque delivery shaft to said ring gear during intermediate and high ratio operation;

second brake means for selectively braking said ring gear during reverse drive operation;

both clutch means being applied during high ratio operation, said first clutch means being located in said second housing portion radially inward of said second clutch means on the side of said compound planetary gear unit remote from said hydrokinetic unit, said final drive gears being located between said hydrokinetic unit and said compound planetary gear unit;

said first clutch means comprising an overrunning coupling and a selectively engageable friction clutch in parallel relationship with respect to said overrunning coupling;

said first clutch means comprising also an input member located radially inward of an output member of said second clutch means on the side of said final drive gears remote from said hydrokinetic unit, said ring gear being connected to said output member of said second clutch means, an output member of said first clutch means being connected to said first sun gear, said final drive gears being connected drivably by a final drive idler gear;

said differential gear unit having a carrier housing, a ring gear on said carrier housing engaging said final drive output gear, separate output side gears of said differential gear unit being connected respectively to each of said driven members, said hydrokinetic unit having an impeller connected to said driving member;

said transaxle housing comprising a single-piece unitary casting in which said first, second and third housing portions are separately defined;

said first and second housing portions being separated by a bearing support wall that forms a part of said unitary casting;

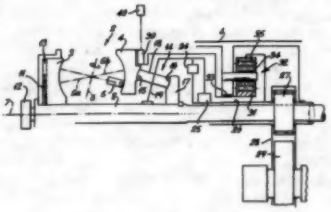
the upper side of said second housing portion being adapted for supporting thereon a control valve assembly.

4,638,687

CONTINUOUSLY-VARIABLE-RATIO TRANSMISSION HAVING A SINGLE INPUT MEMBER

Forbes G. De Brie Perry, Charlbury, England, assignor to National Research Development Corporation, London, England

Filed May 28, 1985, Ser. No. 738,470
Claims priority, application United Kingdom, May 30, 1984, 8413728
Int. Cl.⁴ F16H *37/06, 37/00*
U.S. Cl. 74—691 **8 Claims**



1. A transmission of the toroidal race rolling traction type presenting a principal axis of rotation and having a rotary output capable of rotation in both forward and reverse directions and having at least first and second regimes of operation, and comprising a variator including a first, ratio varying component presenting an output member and an input and a secondary component including gearing capable of being set in different combinations so as to effect change-over between said first and second regime in which:

a rotary thrust bearing supports said output member of said variator;

said rotary thrust bearing includes a part serving also in the said combination of said secondary component that is operable in said first regime, and

said combination of said secondary component that is operable in said first regime also includes a one-way drive member and a locking member arranged in parallel,

through which drive is alternatively transmitted to said transmission output during said first regime according to whether said transmission output is rotating in said forward or said reverse direction; said one-way drive and locking members being arranged in parallel and connected directly both to said rotary thrust bearing part and to said rotary output of said transmission, so that said rotary output rotates at the same speed as said thrust bearing part and in the same rotary sense.

4,638,688

PLANETARY GEAR TRAIN FOR AUTOMOTIVE TRANSMISSION OR THE LIKE

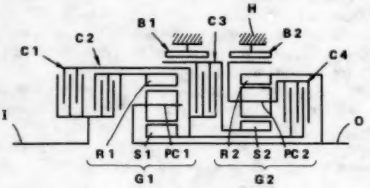
Kazuyoshi Hiraiwa, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 30, 1984, Ser. No. 595,533

Claims priority, application Japan, Apr. 4, 1983, 58-57830; Apr. 4, 1983, 58-57831

Int. Cl.[4] F16H *57/10*

U.S. Cl. 74—763 6 Claims



1. A planetary gear train transmission comprising:

an input shaft operatively connected with a source of rotational energy;

first and second planetary gear sets respectively including first and second sun gears, first and second ring gears, first and second pinion carriers and first and second sets of pinion gears operatively mounted on said first and second pinion carriers and respectively arranged to mesh with their respective sun and ring gears;

a first clutch selectively providing a drive connection between said input shaft and said first sun gear;

a second clutch selectively providing a drive connection between said input shaft and said first ring gear;

a third clutch selectively providing a drive connection between first and second sun gears;

a fourth clutch selectively providing a drive connection between said first sun gear and said second pinion carrier;

a first brake selectively rendering said second sun gear stationary with respect to a housing in which the transmission is disposed;

a second brake selectively rendering said second pinion carrier stationary with respect to said housing; and

an output shaft in drive connection with said first pinion carrier and said second ring gear, such that said transmission produces four forward speeds using only two planetary gear sets.

4,638,689

HYDRAULIC LINE PRESSURE CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

Yasuhito Sakai, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,450

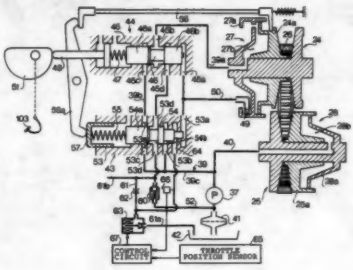
Claims priority, application Japan, Oct. 9, 1983, 58-167272

Int. Cl.[4] B60K *41/14*

U.S. Cl. 74—866 9 Claims

1. An improved control system for an infinitely variable transmission for transmitting the power of an internal combustion engine mounted on a vehicle, the transmission comprising a primary pulley having a hydraulically shiftable disc and a hydraulic cylinder for shifting the disc, a secondary pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc, a belt engaged with both pulleys, a hydraulic circuit having a pump for supplying oil, a transmission ratio control valve responsive to engine speed for controlling the oil and for shifting the disc of the primary pulley to change the transmission ratio, and a pressure regulator valve responsive to the transmission ratio for increasing the line pressure of the hydraulic circuit with increase of the transmission ratio, wherein the improvement comprises:

first means comprising a throttle position sensor for detecting the torque of said engine and an electronic circuit responsive to an output signal of the throttle position sensor for producing a control signal proportional to said torque;



second means responsive to said control signal for operating said pressure regulator valve so as to increase the line pressure with increase of the torque;

said second means comprises a hydraulic control circuit for applying a part of drain oil to said pressure regulator valve and a solenoid operated valve responsive to said control signal for controlling the oil passing through said hydraulic control circuit and for regulating the line pressure;

a pressure sensor for detecting the pressure of the part of the drain oil supplied to the pressure regulator valve and connected to said electronic circuit, the latter producing said control signal further dependent on the pressure of the part of the drain oil supplied to the pressure regulator valve.

4,638,690

METHOD AND APPARATUS FOR CONTROLLING ELECTRONICALLY CONTROLLED TRANSMISSIONS

Toshihiro Hattori, Ayase; Masaki Ishihara, Fujisawa, and Makoto Uriuhara, Yokohama, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 28, 1983, Ser. No. 546,394

Claims priority, application Japan, Oct. 30, 1982, 57-191244

Int. Cl.[4] B60K *41/18*

U.S. Cl. 74—866 10 Claims

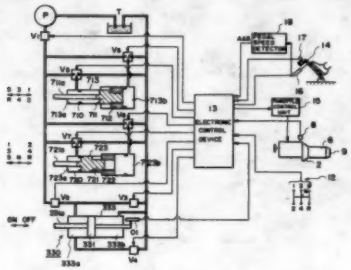
1. A method of controlling an electronically controlled transmission of a vehicle during an abrupt depression of an accelerator pedal to accelerate the vehicle, the transmission having an actuator for a gear changing operation controlled by an electronic control device for changing gear ratios, said method comprising the steps of:

(a) monitoring the speed of depression of an accelerator pedal;

(b) detecting when said speed of depression of the accelerator pedal exceeds a predetermined value;

(c) locking a gear changing operation when said speed of

depression of the accelerator pedal exceeds said predetermined value; and



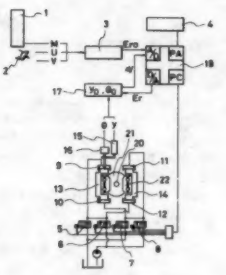
(d) effecting the gear shifting operation after said speed of depression of the accelerator pedal is less than said predetermined value.

4,638,691

CONTROL DEVICE OF AN INFINITELY VARIABLE TRANSMISSION

Hirohisa Tanaka, Tokyo, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,785
Claims priority, application Japan, Aug. 19, 1983, 58-150264
Int. Cl.[4] B60K *41/18*; F16H *15/00*
U.S. Cl. 74—866 **1 Claim**



1. An automatic control system for a toric type infinitely variable transmission of a running vehicle, the speed of which is changed by varying a gear ratio corresponding to a running mode of the vehicle selected by a driver, said transmission comprising coaxially disposed input and output shafts with input and output disks having toroidal surfaces and repectively secured to the input and output shafts, a traction roller engaged with the toroidal surfaces of the disks, and a trunnion rotatably supporting the traction roller on a rotary shaft, said trunnion being linearly movable in the direction of a pivot axis which is perpendicular to the rotary shaft of the traction roller and being pivotable around the pivot axis so that the gear ratio between the input shaft and the output shaft may be changed, said control system comprising:

a hydraulic cylinder receiving an axial end of the trunnion;

a hydraulic circuit connecting the hydraulic cylinder with a hydraulic source, said hydraulic circuit including a solenoid valve, said valve having means for repeatedly opening and closing the valve at predetermined intervals and controlling hydraulic supply to said hydraulic cylinder and thereby controlling the linear movement of the trunnion in the direction of the pivot axis so as to vary the gear ratio;

first detector means for detecting the amount of the linear movement of the trunnion in the direction of the pivot axis and producing a first signal;

second detector means for detecting the amount of the pivotal movement of the trunnion and producing a second signal; and

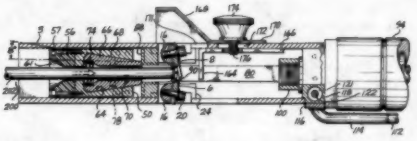
an electronic control circuit for receiving said first and second signals from said first and second detector means, determining a suitable gear ratio conforming to the running mode and said signals and feeding a pulse signal according to the suitable gear ratio back to the solenoid valve in order to open and close the solenoid valve at the predetermined intervals.

4,638,692

WIRE STRIPPER WITH DOUBLE WEDGE SPRING LOADED GRIPPER

Isaac M. Bensussen, and Hans Tittel, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 26, 1985, Ser. No. 769,958
Int. Cl.[4] H02G *1/12*
U.S. Cl. 81—9.41 **31 Claims**



1. For use with wire of the type having an inner core and an outer covering, a wire stripper for removing an end portion of the covering from the core, said stripper comprising:

blade means for cutting substantially through the covering in a substantially radial direction, said blade means being positioned and dimensioned to provide clearance between itself and the core to avoid contact with the core;

gripping means positioned axially outwardly of the blade means for gripping wire to be stripped; said gripping means including an axially slidable gripper housing, gripper jaw means, and first and second biasing means; said housing having an axial passageway extending therethrough for receiving the wire, and portions defining a chamber which surrounds the passageway and has generally axially extending sidewall means that tapers toward the blade means; said jaw means being dimensioned to be slidably and closely received into the chamber defined by the housing; said jaw means including a plurality of gripper jaws, each of which has a tapered outer surface that slidingly engages said sidewall means and an axially extending inner grip surface for gripping the wire; said first biasing means urging the jaws radially outwardly toward said sidewall means; and said second biasing means urging the jaws axially inwardly toward the blade means; and

actuating means for engaging the housing and moving it axially outwardly, to tighten the jaws around the wire and pull the wire away from the blade means to in turn strip said end portion of the covering from the core.

4,638,693

BAR STOCK FEEDER

Kenji Sugimoto, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1984, Ser. No. 645,670
Claims priority, application Japan, Sep. 27, 1983, 58-179005
Int. Cl.[4] B26D *13/02, 13/04*
U.S. Cl. 82—2.5 **7 Claims**

1. A bar stock feeder for a processing machine having a hollow spindle, comprising:

first support means;

cover means provided adjacent said hollow spindle and pivotally supported by said first support means;

second support means;

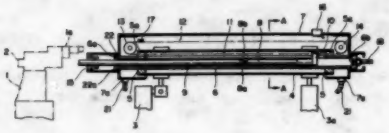
at least one rod guide tube supported by said second support means in said cover means and having a front end opening for passing a bar stock and a longitudinal slit;

an elongated flexible member provided to be moved along said rod guide tube in the longitudinal direction;

guide means for guiding said elongated flexible member;

a push rod slidably mounted in said rod guide tube;

a flag for operatively connecting said push rod to said elongated flexible member through said slit;



means for moving said elongated flexible member to advance said push rod;

said cover means being for covering the entirety of the rod guide tube, flexible member, guide means, and flag;

lubricating oil passage means from an inlet formed in a rear portion of the rod guide tube to an outlet formed in a lower portion of the cover means passing through the rod guide tube;

lubricating oil supply means for supplying lubricating oil to said rod guide tube passing through said passage means; and

drain means connected to said passage means for returning lubricating oil to said supply means.

4,638,694

MANUFACTURE OF PISTONS

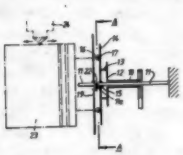
Roger H. Slee, Warwick, England, assignor to AE Plc, Warwickshire, England

Filed Jun. 26, 1985, Ser. No. 748,976

Claims priority, application United Kingdom, Jun. 27, 1984, 8416380

Int. Cl.[4] B23B *5/24, 41/04*

U.S. Cl. 82—18 **3 Claims**



1. A machine tool for turning a piston having a surface of oval cross-section, comprising:

a rotatable input shaft for imparting rotational drive to the piston and having an axis of rotation,

slide means connected to the rotatable input shaft for rotation thereby about said input shaft axis of rotation,

a piston-carrying member engaging said slide means for rotation thereby, said slide means permitting reciprocation of the piston-carrying member relative to said input shaft in a direction normal to said axis of rotation,

a link connected at one end to a fixed pivot defining a link axis of rotation, said link axis of rotation being offset from said input shaft axis of rotation, and connected at an end opposite to said one end to said piston-carrying member, a line between said connections being parallel to the said direction of reciprocation of said piston-carrying member,

a tool carried on mounting means for movement in directions towards and away from the axis of rotation of the input shaft, the tool turning said surface when at a fixed point in said direction of movement.

4,638,695

BOARD SAW WITH SAWDUST EXHAUST

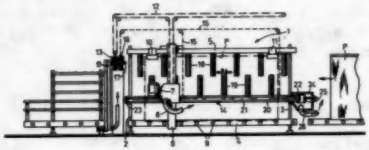
Ludwig Striebig, Lucerne, Switzerland, assignor to Striebig AG, Switzerland

Filed May 8, 1984, Ser. No. 608,127

Claims priority, application Switzerland, May 9, 1983, 2528/83

Int. Cl.[4] B27B *5/06*; B27G *3/00*

U.S. Cl. 83—100 **8 Claims**



1. Apparatus for making horizontal and vertical cuts comprising an upright frame having a length and a height, at least one motor-driven sawing unit which is supported by the frame and displaceable in the vertical and horizontal directions and which further includes a circular saw blade having a perimeter, an exhaust pipe connectable at one end to a vacuum source and connected at the other end to the at least one sawing unit, an exhaust duct which is connectable to a vacuum source and extends along the frame length, and is slidably vertically mounted upon the frame, the exhaust duct having a closed hollow profile with a blade face and a frame face, a movably mounted band supported by the frame which is movable along the blade face and which is positively connected to the horizontal displacement of the sawing unit, the band having an exhaust slot adjacent the saw blade at the point of sawing, considered in the sawing direction, such that the object being sawn passes between the saw unit and the exhaust duct to exhaust the sawdust produced behind the object being sawn.

4,638,696

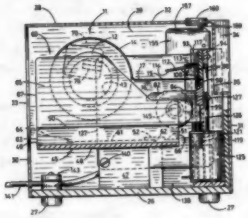
APPARATUS FOR DISPENSING STRIP MATERIAL OR THE LIKE

Peter R. Urwyler, Modesto, Calif., assignor to Simtek Inc., Modesto, Calif.

Filed Sep. 17, 1984, Ser. No. 651,263

Int. Cl.[4] B65H *75/00*; B26D *5/22*

U.S. Cl. 83—261 **7 Claims**



3. An apparatus for dispensing strip material or the like from a source of said material, the apparatus comprising a frame; a

drive wheel mounted on the frame for substantially rotational movement; means borne by the frame for mounting a source of said strip material and having a pair of spaced substantially parallel guides mounted thereon, the guides of said pair spaced from each other a distance permitting a lead portion of said strip material to be supported on and extended between the guides with said guides on opposite sides of the drive wheel and with said lead portion of the strip material above the drive wheel; control means borne by the frame for placing the lead portion of the strip material in contact with the drive wheel; and means connected in driving relation to the drive wheel for selectively rotating the drive wheel to feed the lead portion of the strip material from the frame upon engagement of the lead portion with said drive wheel.

4,638,697

FROZEN MEAT CUTTER

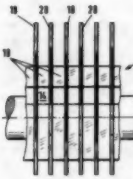
Juergen Hager, Hückeswagen; Walter Vieth, Wermelskirchen, and Werner Manderla, Remscheid, all of Fed. Rep. of Germany, assignors to Magurit-Gefrierschneider GmbH, Hoehenweg, Fed. Rep. of Germany

Filed Jan. 9, 1986, Ser. No. 817,392

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1985, 8505329[U]

Int. Cl.[4] B26D *3/22*

U.S. Cl. 83—356.3 **11 Claims**



1. In a machine for slicing and cutting slabs of frozen meat into generally cube-like portions, a rotatable slicing and cutting drum comprising:

a plurality of side-by-side, alternatingly disposed slitting discs and knife discs mounted for rotation together as a unit,

said slitting discs being operable to make parallel longitudinal slices in a meat slab fed radially against the drum as the latter rotates to thereby produce a plurality of side-by-side meat strips,

said knife discs being operable to cut the meat strips laterally into individual cube-like portions,

said slitting discs having a slicing edge extending between a first point on the disc which is forward relative to the direction of rotation of the drum, and a trailing point, said trailing point being disposed at a greater radial distance from the axis of rotation of the disc than said first point.

4,638,698

DROP FEED MITERING MACHINE

Bruce D. Omholt, Rohnert Park, Calif., assignor to Prints Plus, Inc., Martinez, Calif.

Filed Feb. 28, 1986, Ser. No. 834,623

Int. Cl.[4] B27G *5/04*

U.S. Cl. 83—444 **17 Claims**

1. A drop feed mitering machine comprising

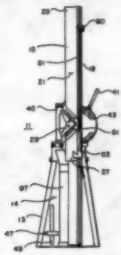
(a) a base,

(b) an elongated work table extending upwardly from said base in a near vertical orientation, said work table having top and bottom ends and a front work plane that defines the front of said machine,

(c) a cutting throat running through said table intermediate the top and bottom ends thereof,

(d) a cutting element moveably mounted to pass through said cutting throat,

(e) means accessible from the front of said machine for causing said cutting element to pass in a cutting action through said cutting throat,



(f) means accessible from the front of said machines for drop feeding a length of molding downwardly along the front plane of said work table over said cutting throat to a preadjusted position whereby said cutting element can by actuated to cut the molding to yield a cut piece of molding of a predetermined length.

4,638,699

SHEAR FOR PROFILE AND/OR FLAT AND/OR SOLID-SECTION STEEL STOCK

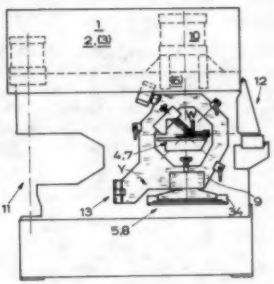
Werner Schröder, Auf dem Hahne 5, 5950 Finnentrop 1, Fed. Rep. of Germany

Filed Aug. 30, 1985, Ser. No. 771,364

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432672

Int. Cl.[4] B23D *23/00*

U.S. Cl. 83—452 **14 Claims**



1. In a shear for cutting profile and/or flat and/or solid-section steel and comprising:

at least one vertical frame plate;

at least one fixed blade carried on the plate;

a working slide displaceable on the frame plate and carrying a movable blade passing past the fixed blade on movement of the slide on the frame plate; and

means including a holddown engageable between a workpiece and the frame for pressing the workpiece against the fixed blade, the improvement comprising

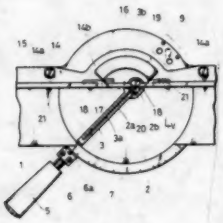
pivot means defining for the holddown on the frame a first vertical axis parallel to the plate and a second horizontal axis generally perpendicular thereto for pivotal displacement of the holddown on the frame.

4,638,700

PORTABLE MITER SAWS

Fusao Fushiya; Nobuo Hakamata; Hiroyuki Abe, and Nobuhiro Inoue, all of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan

Filed Mar. 10, 1986, Ser. No. 837,820
Claims priority, application Japan, Jun. 12, 1985, 60-127838
Int. Cl.[4] B27B 5/24
U.S. Cl. 83—467 R 7 Claims



1. A portable miter saw of the type driven by an electric motor, comprising:

a supporting base;

a horizontal turntable mounted for selective rotatable movement on said supporting base;

a support arm having a lower end fixedly connected with one peripheral portion of said turntable and an upper end adapted to move along a vertical path relative to said turntable;

a saw blade rotatably carried on said upper end of said support arm generally above said turntable;

a guide fence mounted on said base and including a pair of work engaging surfaces longitudinally aligned across a blade clearance gap formed therebetween to provide passage of said saw blade; and

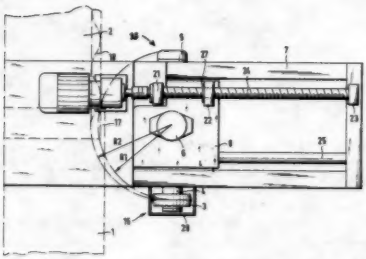
shutter means operatively connected to said turntable for shutting said blade clearance gap and slidable on said guide fence upon rotation of said turntable to selectively change the cutting angle of said saw blade.

4,638,701

SHEARS, ESPECIALLY CIRCULAR KNIFE SHEARS

Karol H. Oberländer, Mainleus, and Norbert Umlauf, Haferkamp 64, D-5800 Hagen 1, both of Fed. Rep. of Germany, assignors to Norbert Umlauf, Hagen, Fed. Rep. of Germany

Filed Jan. 2, 1985, Ser. No. 688,302
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1984, 3400122
Int. Cl.[4] B23D 31/04
U.S. Cl. 83—490 12 Claims



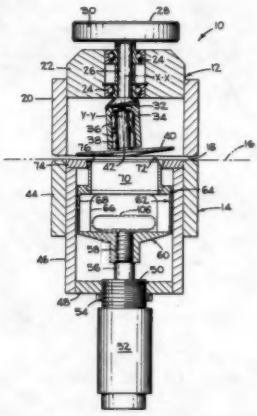
1. Shears for cutting out segments and strips from metal bands movable along a generally horizontal rectilinear path of travel, comprising a linearly displaceable guide block, said guide block includes a knife carrier, an upper and a lower circular knife mounted on said knife carrier and arranged to cooperate and cut the metal bands, a pivoting drive mounted on said guide block and in engagement with said knife carrier for displacing said upper and lower circular blades spaced outwardly from said pivoting drive along a generally horizontal arcuate path from a location spaced laterally from the path of travel of the metal bands to a location in the path of travel of the metal bands for cutting the metal bands, said guide block having a recess therein extending upwardly from said knife carrier, a vertical journal secured to said knife carrier and extending upwardly into the recess, said pivoting drive includes a pivoting motor secured to and extending upwardly from said guide block and said pivoting motor includes a splined shaft extending downwardly from said motor and disposed in engagement with said journal for pivoting said knife carrier.

4,638,702

WEB CUTTING METHOD AND APPARATUS

René F. DeBin, Aalst, and Emiel Y. Lambrecht, Gijzegem - Aalst, both of Belgium, assignors to FMC Corporation, Chicago, Ill.

Filed Jul. 17, 1984, Ser. No. 631,694
Int. Cl.[4] B26F 1/00; B26D 1/45
U.S. Cl. 83—509 6 Claims



1. An apparatus for cutting an aperture of a selected nonlinear configuration in thin web material comprising a knife having a cutting edge located in a plane and formed to define the selected configuration;

means for tangentially engaging the cutting edge with sufficient force to penetrate a web adjacent the cutting edge; means for rotating said tangentially engaging means about an axis contained within the projected area defined by the cutting edges; and means for translating the cutting edge engaging means along the cutting edge at least until the web overlaying the cutting edge has been cut.

4,638,703

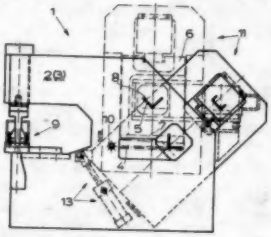
SHEAR FOR DIFFERENT STRUCTURAL SHAPES

Karl-Heinz Muhr, In der Stesse 2, D-5952 Attendorn, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,919
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418423
Int. Cl.[4] B26D 9/00
U.S. Cl. 83—518 18 Claims

1. A shear for severing at least two different structural shapes, comprising:

a machine body;
a shear slide pivotally mounted on said machine body to swing about a horizontal axis between a first operating position and a second operating position angularly offset from said first position about said axis, said shear slide being capable of rectilinear movement;
a pair of fixed blades spaced apart in the direction of said rectilinear movement when said slide is in said first operating position and oriented to cut respective structural shapes; and
a respective movable blade on said slide juxtaposed and paired with each of said fixed blades and cooperating with the respective fixed blade to sever the respective structural shape upon said rectilinear movement of said slide, said blades being positioned with respect to said axis so that each pair of blades is disposed at a common given working height in a respective severing position thereof.

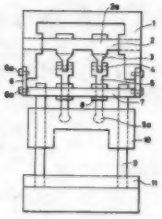


4,638,704

PRESS DEVICE HAVING MEANS TO ENABLE RAM AND BOLSTER TO BE REMOVED AS A UNIT

Hiroshi Wanibuchi, and Akira Kubota, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha and Kabushiki Kaisha Kuboto Tekkojo, both of Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,533
Int. Cl.⁴ B26F *1/02*
U.S. Cl. 83—628 **4 Claims**



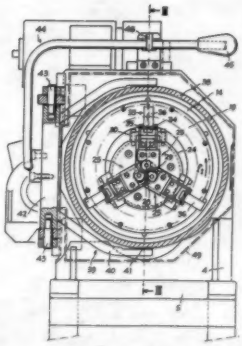
1. In a press device having an upstanding main frame: a support member detachably disposed on a lower portion of the main frame; a plate member disposed at a middle portion of the main frame and having a plurality of openings extending therethrough; securing members detachably securing the plate member to the middle portion of the main frame; a plurality of upstanding struts connected at their bottom ends to the support member and at their top ends to the plate member; a ram mounted to undergo reciprocal sliding movement along the struts and coacting with the support member for performing a work-pressing operation during use of the press device; a plurality of connecting members slidably extending through respective ones of the plate member openings and having their lower ends connected to the ram; a turnable crank shaft turnably mounted on an upper portion of the main frame; and means detachably connected to the upper ends of the connecting members for converting the turning movement of the crank shaft into linear movement of the connecting members to thereby raise and lower the ram; whereby the plate member, connecting members, ram, support member and struts can all be detached from the main frame and removed therefrom as a single unit.

4,638,705

MACHINE FOR TRIMMING AND DISBUDDING VINE SHOOTS

Chazalon Michel, La Bastide, Vogue-07200 Aubenas, France

Filed Feb. 21, 1986, Ser. No. 831,537
Claims priority, application France, Feb. 26, 1985, 85 03005
Int. Cl.⁴ A01G *17/00*
U.S. Cl. 83—701 **10 Claims**



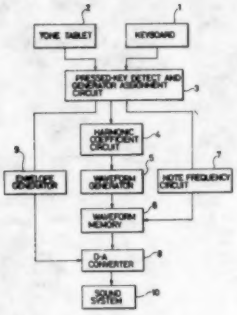
1. Machine for trimming and disbudding vine shoots destined to be used subsequently as graft-supports, of the type comprising, a cutting device with an inlet hatch for a vine shoot, and at least one cutter rotating about the horizontal axis of said inlet hatch mounted on a supporting frame and a forward drive assembly for the shoot; formed at by at least two press-rollers resiliently disposed in superposed manner, one at least of which is driven in rotation by a drive member, said machine having a vertical frame, said frame defining a cylindrical bearing surface of horizontal axis, supporting a rotating trimming and disbudding head comprising:
a main annular plate,
a tool-holding annular platen, mounted loosely radially with elastic centering on the plate with which it defines the inlet hatch,
a plurality of combined tools, at equal annular distance one from the other, mounted on said platen each tool being formed by:
a radial slide-block carrying a cutter and a rotating roller of which the rotation plane forms an angle different from 90° with the axis of the hatch, said slide-block being urged into a centripetal movement by an elastic member,
a lever, including a small branch and a large branch, carried by the platen, and of which the small branch is engaged under a yoke of the slide-block,
a ring, the large branch of each lever resting against the ring, and which ring is carried by a fork hinged on to the frame, and
means for controlling, via said fork, the axial movement of the ring in the same direction as that into which the slide-blocks are urged by the levers moving centrifugally against the action of their elastic return members.

4,638,706

ELECTRONICAL MUSICAL INSTRUMENT WITH NOTE FREQUENCY DATA SETTING CIRCUIT AND INTERPOLATION CIRCUIT

Yoichi Nagashima, Hamamatsu; Tatsunori Kondo, Shizuoka; Kiyomi Takauji, Hamamatsu; Mineo Kitamura, Hamamatsu; Tadashi Matsushima, Hamamatsu; Eiji Nagashima, Kami, and Masafumi Mizoguchi, Hamamatsu, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Oct. 26, 1984, Ser. No. 665,126
Claims priority, application Japan, Oct. 27, 1983, 58-201664
Int. Cl.[4] G10H 7/00
U.S. Cl. 84—1.01 2 Claims



1. An electronic musical instrument of the type that forms a musical waveform by calculating the waveform amplitude value at each sample point of the musical waveform through Fourier synthesis, comprising:

a memory circuit for storing a plurality of sets of artibrary harmonic coefficients for use in the Fourier synthesis, each set of arbitrary harmonic coefficients including a series of arbitrary harmonic coefficients occupying different addresses in said memory circuit, said arbitrary harmonic coefficients in each set having a characteristic wave pattern of a musical waveform to be synthesized;

a note frequency data setting circuit for setting a component ratio of a harmonic coefficient in accordance with the note frequency of a musical waveform to be synthesized, said note frequency data setting circuit selecting from and between the sets of arbitrary harmonic coefficients stored in said memory circuit;

an address data generator for generatig readout addresses for reading out one set of the arbitrary harmonic coefficients from the memory circuit in accordance with the note frequency data of the musical waveform to be synthesized;

an interpolation circuit for calculating actual harmonic coefficient data by starting at a starting address of the readout addresses from the address data generator, and by skipping by a selected skip value along the series of arbitrary harmonic coefficients in the readout addresses, the musical waveform to be synthesized having its characteristic wave pattern because of the selection of the set of arbitraryharmonic coefficients while having acual harmonic coefficients calculated by said interpolation circuit.

4,638,707

DATA MASK TONE VARIATION IN AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Oct. 4, 1984, Ser. No. 657,648
Int. Cl.[4] G10H 1/06
U.S. Cl. 84—1.19 18 Claims

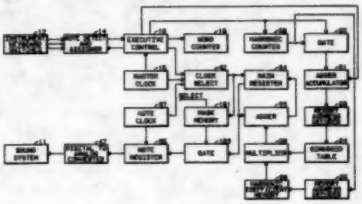
1. In combination with a musical instrument in which a plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed from a preselected set of harmonic coefficients and are transferred sequentially to a means for conversion into musical waveshapes, apparatus for selectively modifying said waveform of a musical tone in response to a control signal comprising;

a first waveshape memory means,

a means for computing responsive to said preselected set of harmonic coefficients whereby said plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed and stored in said first waveshape memory means,

a mask data generator means for creating a mask data word in response to said control signal wherein said mask data word is in a binary digital format having a number of bits equal in number to said plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone,

a memory addressing means for simultaneously reading out



a data word stored in said first waveshape memory means and for selecting a corresponding bit of said mask data word created by said mask data generator means,

a second waveshape memory means,

a mask gate responsive to said selected bit provided by said memory addressing means whereby said data word read out from said first memory means is transferred unaltered if the corresponding bit of said mask data word has a logic value of "1" and whereby a zero value data word is transferred if said corresponding bit of said mask data word has a logic value of "0" and whereby the transferred data words are stored in said second waveshape memory means,

a waveshape reading means whereby data words are sequentially and repetitively read out from said second waveshape memory means, and

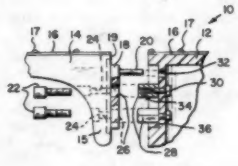
a means for producing musical tones responsive to product data words read out of said second waveshape memory means.

4,638,708

STRINGED INSTRUMENT

Benjelloun Kamal, 45 Sintsink Dr., West, Port Washington, N.Y. 11050

Filed Mar. 24, 1986, Ser. No. 842,923
Int. Cl.[4] G10D 3/00
U.S. Cl. 84—293 4 Claims



1. An improved stringed instrument of the type having a

body with an elongated neck extending therefrom, said neck having a heel adjacent said body and a fingerboard having frets thereon, said fingerboard mounted onto said neck and said body, the improvement comprising:

(a) said neck being removable from said boy and including a bracket mounted to back end of said heel, said bracket having an alignment post extending therefrom and a pair of hex holes spaced below said alignment post, said heel having a pair of mounting holes therein in alignment with said hex holes;

(b) said body having a recess for receiving said bracket, said recess having an alignment hole for receiving said alignment post;

(c) a pair of hex bolts having threaded holes therein, said hex bolts mounted within said recess below said alignment hole for receiving said hex holes of said bracket; and

(d) a pair of mounting bolts for extending through said mounting holes in said heel to thread within said threaded holes of said hex bolts for securing said neck to said body so that said neck can be removed for storing said stringed instrument in a smaller area.

4,638,709

ELECTRONIC MUSICAL INSTRUMENT WITH TEMPORAL VARIATION DATA GENERATING CIRCUIT AND INTERPOLATION CIRCUIT

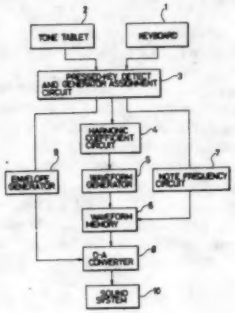
Yoichi Nagashima, Hamamatsu; Tatsunori Kondo, Shizuoka; Kiyomi Takauji; Mineo Kitamura, both of Hamamatsu; Tadashi Matsushima, Hamamatsu; Eiji Nagashima, Kami, and Masafumi Mizoguchi, Hamamatsu, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Oct. 26, 1984, Ser. No. 665,125

Claims priority, application Japan, Oct. 27, 1983, 58-201663

Int. Cl.[4] G10H *7/00*

U.S. Cl. 84—1.19 **2 Claims**



1. An electronic musical instrument of the type that forms a musical waveform by calculating the waveform amplitude value at each sample point of the musical waveform through Fourier synthesis, comprising:

a memory circuit for storing a plurality of sets of arbitrary harmonic coefficients for use in the Fourier synthesis, each set of arbitrary harmonic coefficients including a series of arbitrary harmonic coefficients occupying different addresses in said memory circuit, said arbitrary harmonic coefficients in each set having a characteristic wave pattern of a musical waveform to be synthesized;

a temporal variation data generating circuit for setting a component ratio of a harmonic coefficient in accordance with temporal variations which vary with time, of a musical waveform to be synthesized, and by selecting from and between the sets of arbitrary harmonic coefficients stored in said memory circuit;

an address data generator for generating readout addresses for reading out one set of the arbitrary harmonic coefficients from the memory circuit in accordance while varying them in response to the temporal variations of the musical waveform to be synthesized;

an interpolation circuit for calculating actual harmonic coefficient data by starting at a starting address of the readout addresses from the address data generator, and by skipping by a selected skip value along the series of arbitrary harmonic coefficients in the readout addresses, the musical waveform to be synthesized having its characteristic wave pattern because of the selection of the set of arbitrary harmonic coefficients while having actual harmonic coefficients calculated by said interpolation circuit.

4,638,710

PERIODIC WAVEFORM GENERATION BY NONRECYCLICALLY READING LOWER FREQUENCY AUDIO SAMPLES AND RECYCLICALLY READING HIGHER FREQUENCY AUDIO SAMPLES

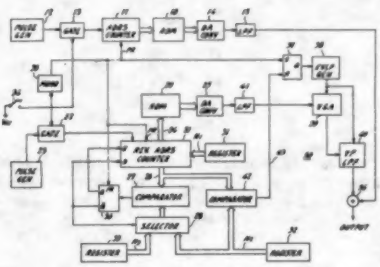
Masatsugu Kitamura, Atsugi; Kikuji Wagatsuma, Sagamihara; Tokumi Watanabe, Tokyo; Naoki Yamashita, Tokyo, and Hiroshi Yoshida, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Nov. 2, 1984, Ser. No. 667,622

Claims priority, application Japan, Nov. 5, 1983, 58-207982

Int. Cl.[4] G10H *1/02, 7/00*

U.S. Cl. 84—1.26 **6 Claims**



1. An electronic musical instrument comprising:

a first memory with a plurality of amplitude data stored at sequentially addressible locations of the first memory, the amplitude data stored in the first memory representing the amplitudes of lower frequency components of a section of a percussive waveform;

a second memory with a plurality of amplitude data stored at sequentially addressible locations of first and second portions of the second memory, the amplitude data stored in said first portion representing the amplitudes of higher frequency components of a rising section of said percussive waveform and the amplitude data stored in said second portion representing the amplitudes of said higher frequency components of a second section of the percussive waveform which immediately follows said rising section, a phase variation of said higher frequency components being unnoticeable by human ears;

first memory address means for addressing said first memory at a lower rate and generating from said first memory a first output waveform corresponding to the waveform of the lower frequency components;

second memory address means for addressing the first and second portions of said second memory at a higher rate in forward scan and subsequently recyclically addressing the second portion in rearward and forward scans and generating from said second memory a second output waveform having a first part corresponding to said rising section of the waveform of the higher frequency components and a second part corresponding to a series of the recyclically addressed versions of said second section of said higher frequency waveform; and

means for combining said first and second output waveforms.

4,638,711

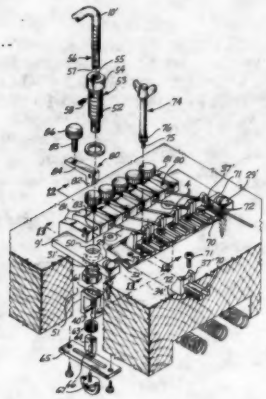
TREMOLO ACCESSORY

Paul F. Stroh, 10229 42nd S.W., Seattle, Wash. 98146

Continuation-in-part of Ser. No. 315,318, Oct. 26, 1981. This application Aug. 17, 1984, Ser. No. 642,220

Int. Cl.[4] G10D *3/04, 3/12*

U.S. Cl. 84—313 **10 Claims**



1. In a guitar-like musical instrument having a body portion, several generally parallel strings anchored to such body portion, such body portion including a tremolo bridge engaged by the strings and normally movable in opposite senses from a central position relative to the remainder of the body portion, movement of the tremolo bridge in one sense from the central position effecting an increase in the string tension and movement of the tremolo bridge in the opposite sense from its central position effecting a decrease in the string tension for producing a tremulous tone effect, and resilient means biasing the tremolo bridge to its central position, the improvement comprising means for selectively locking the tremolo bridge in its central position so as to block substantial movement of the tremolo bridge mechanism in either sense from such position.

4,638,712

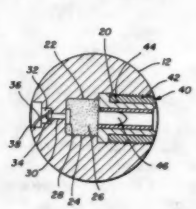
BULLET PERFORATING APPARATUS, GUN ASSEMBLY AND BARREL

Manmohan S. Chawla, and Junius L. Speights, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 11, 1985, Ser. No. 690,701

Int. Cl.[4] E21B *43/116*

U.S. Cl. 89—1.15 **5 Claims**



1. A bullet perforating gun for use in a borehole traversing subsurface earth formations, comprising:

an elongated gun body member adopted to traverse a borehole, said body member including a plurality of lateral apetures therein, said apetures having a threaded portion thereof;

a plurality of replaceable barrel members, each of said barrel members having an axis of perforation generally perpendicular to the longitudinal axis of said gun body member and consisting of a first tubular member of low thermal expansion ceramic material, said first tubular member having a longitudinal bore therethrough for closely passing a protectible therethrough, and a second generally tubular member of shape memory material coaxially disposed about said first tubular member, said second member having an enlarged outer diameter base portion; and

an outer member for each said barrel members coaxially disposed about said second member and threadably engagable into said apertures within said gun body member, said outer member abutting said enlarged outer diameter base portion of said second member for retaining said second member within said gun body member.

4,638,713

THERMAL SLEEVE FOR GUN BARRELS

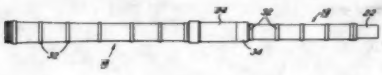
Alistair R. Milne, Washington, and Grenville Davison, Newcastle Upon Tyne, both of England, assignors to Vickers Public Limited Company, London, England

Filed Nov. 25, 1985, Ser. No. 801,573

Claims priority, application United Kingdom, Nov. 26, 1984, 8429775

Int. Cl.[4] F41F *17/04, 17/06*

U.S. Cl. 89—14.1 **5 Claims**



1. A thermal sleeve for a gun barrel comprising a cylinder of substantially rigid, thermally insulating material shaped to embrace at least part of the gun barrel, a plurality of longitudinally and circumferentially spaced spacer members on the inside face of the cylinder for engagement with the gun barrel to define an annular gap between the cylinder and the gun barrel, means for sealing said annular gap, and a series of axially spaced circumferential clamps each surrounding the cylinder, each clamp being axially aligned with an associated series of circumferentially spaced spacer members whereby, on tightening of the clamp, said spacer members are urged into pressurized contact with the gun barrel.

4,638,714

CANNON WITH LONGITUDINALLY SHIFTABLE BARREL

Wolfgang Heintz; Manfred Pehker, both of Duesseldorf, and Josef Metz, Neuss, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,453

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148265

Int. Cl.[4] F41D *11/24*

U.S. Cl. 89—37.01 **16 Claims**

1. In a cannon barrel assembly having:

a barrel centered on and extending along a barrel axis,

a barrel tube member generally coaxially surrounding the barrel and having a pair of axially opposite tube member muzzle and breech ends; and

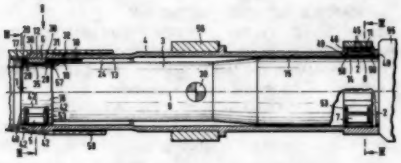
respective muzzle and breech bearings mounted at the tube member ends axially displaceably supporting the barrel therein;

the improvement wherein at least one of the bearings comprises:

an inner bearing ring tightly coaxially fitted on said barrel;

a support on the bearing ring for the spring means;

two lower and one upper segmental slide elements generally angularly equispaced about the axis of the barrel and radially mounted in bearing ring against axial displacement therein, the two lower elements being also mounted in said the tube member against radial displacement therein, the upper element being limitedly radially displaceable in the bearing ring; and



spring means braced between the supporting ring support and the upper slide element for urging said element radially outward against a confronting surface of said tube member which is in surface contact therewith and thereby urging the two lower slide elements in surface contact against the confronting surfaces of said tube member.

4,638,715

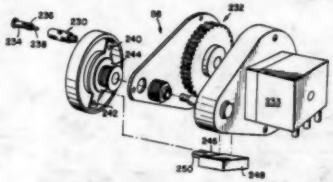
HANDWHEEL ASSEMBLY FOR WEAPON SYSTEM

Richard S. LeBlanc, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 680,799, Dec. 13, 1984, Pat. No. 4,574,683, which is a continuation of Ser. No. 437,853, Oct. 29, 1982, abandoned. This application Aug. 2, 1985, Ser. No. 761,916

Int. Cl.[4] F41F *21/08*

U.S. Cl. 89—41.12 **2 Claims**



1. A weapon system comprising:

a main gun having a firing mechanism mounted for rotation about a horizontal axis,

a hydraulic cylinder means operatively connected at one end to said gun for rotating said gun in elevation about said horizontal axis,

a pump operatively connected to said hydraulic cylinder means,

a gear box assembly operatively connected to said pump,

a handwheel assembly operatively connected to said gear box assembly,

a handle connected to said handwheel assembly for rotating said handwheel assembly relative to said gear box assembly,

a trigger attached to said handle,

a switch having an actuating member and operatively connected to said firing mechanism, said switch being actuated by movement of said actuating member,

a connecting means for connecting said trigger with said actuating member so that when said trigger is depressed said actuating member is moved thereby actuating said switch,

said connecting means including a yoke connected at one end to said trigger and fixed at an opposite end to said rotatable handwheel assembly so that said one end moves relative to said handwheel assembly when said trigger is depressed, a switch plate engageable with said yoke and with said actuating member and positioned so that when said one end is moved by the depression of said trigger said switch plate moves said actuating member thereby actuating said switch,

said handwheel assembly including a drive shaft rotated by the movement of said handle relative to said gear box assembly and operatively connected to said gear box assembly,

said yoke and said switch plates having openings and said drive shaft passing through said openings, and

a second spring means being disposed about said drive shaft for returning said switch plate to its original position after said trigger has been released.

4,638,716

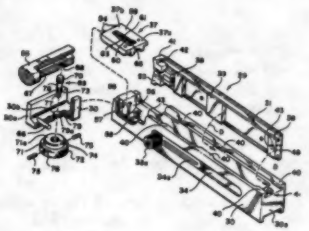
MACHINE GUN RECEIVER TOP STRAP

Charles W. Goff, 1267 W. 1875 North, Farmington, Utah 84025, and Charles W. Goff, Jr., 479 Laurelwood Dr., Kaysville, Utah 84037

Division of Ser. No. 580,366, Feb. 15, 1984, Pat. No. 4,573,394. This application Nov. 25, 1985, Ser. No. 801,222

Int. Cl.[4] F41C *11/00*

U.S. Cl. 89—199 **5 Claims**



1. An arrangement for maintaining a top strap in covering engagement over an open top portion of a receiver of a weapon that includes a feed block comprising, with a gun that includes a rectangular shaped receiver that mounts a feed block in a forward end thereof to be adjacent to a barrel breech of an assembled gun, which receiver is open along a top portion that is stepped upwardly from said feed block mount for supporting a bolt therein; a top strap formed to fit in covering engagement over the receiver stepped up portion such that a forward end of said top strap will overlap the feed block rearmost edge to maintain said feed block edge positioning in said receiver, which top strap includes flange sections that extend horizontal outwardly, at spaced intervals, from along opposite longitudinal sides of said top strap undersurface; in the receiver, spaced apart horizontal inwardly projecting rail sections formed at intervals along longitudinal sides of the receiver upwardly stepped top portion to accommodate said flange sections for fitting therebetween to slide along said rail section undersurfaces as the top strap is moved longitudinally to a covering attitude; and means on the receiver distal end for releasably maintaining the top strap in its receiver covering attitude.

4,638,717

COMBINATION OF CUSHION, ADJUSTER AND SIDE PORTS IN A SINGLE UNIT ROTARY ACTUATOR

Paul Carr, Massillon, Ohio, assignor to Flo-Tork, Inc., Orrville, Ohio

Filed Feb. 1, 1985, Ser. No. 697,345

Int. Cl.[4] F15B *15/22, 15/24*

U.S. Cl. 91—26 **9 Claims**

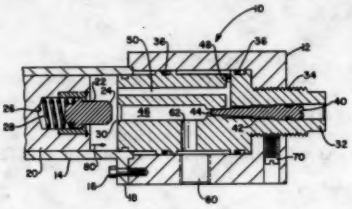
1. A fluid controlled actuator including a housing defining a first cylinder with a linear moving driving piston therein which is characterized by:

a separate cylinder head fixedly defining a second cylinder and attached to the housing with the respective cylinders in alignment;

an adjuster piston slidably received in the aligned cylinders;

means to control and lock the linear position of the adjuster pistion at a desired location within the aligned cylinders, thus limiting the length of travel of the driving piston;

means to provide cushioning of the termination of the driving piston stroke by mechanism associated with the respective pistons themselves, said means comprising a spring pressed pin reciprocable in a cavity in said driving piston and projecting beyond the end thereof, a first passage in said adjuster piston in axial alignment with said



pin, said first passage being normally open at the inner end of said adjuster piston and being closed by said pin as said driving piston approaches the forward end of its travel, second passage means extending through said adjuster piston from the inner end thereof to said first passage means, and an adjustable needle in said adjuster piston for restricting the flow of fluid through said second passage means;

a first side port extending through the cylinder head in a direction transverse to the direction of piston movement to provide fluid pressure to said driving piston; and

a second side port extending transversely through the adjuster piston and communicating with said first passage means and said first side port.

4,638,718

FLUID-PRESSURE DRIVING DEVICE

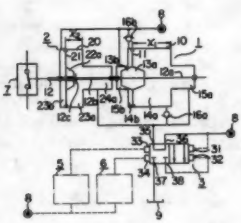
Ichiro Nakamura, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,847

Claims priority, application Japan, Oct. 28, 1983, 58-200924

Int. Cl.[4] F15B *15/17*

U.S. Cl. 91—178 **5 Claims**



1. A fluid-pressure driving device having a control valve means operable in response to an operation instruction and an actuator means in which actuating power is produced by a pressurized working fluid from the control valve means, said actuator means comprising:

a main actuator unit displaceable over a predetermined stroke;

an accelerating actuator unit separate from and coaxially disposed in relation to said main actuator unit and having a smaller stroke displacement than that of said main actuator unit;

said main actuator unit having a piston, a rod, and fluid chambers on both sides of said main actuator unit piston;

said accelerating actuator unit having a piston and fluid chambers on both sides of said accelerating actuator unit piston, which is displaceable along said rod such that both pistons move together in a low accelerating speed range while only said main actuator unit piston moves after acceleration beyond the range; and

one of said chambers of said main actuator unit communicate with a source of the pressurized working fluid through a check valve, while the remaining chamber of said main actuator unit communicates with the source of pressurized working fluid through another check valve, said piston of said main actuator unit having a projecting cushioning portion, one of said chambers of said accelerating actuator unit communicates with the source of said pressurized working fluid while the other of said chambers of said accelerating unit communicates with said control valve means, wherein said control valve means drives said main actuator unit and said accelerating actuator unit in response to an operation instruction.

4,638,719

UNBALANCED HYDRAULIC AMPLIFIER VALVE ASSEMBLY

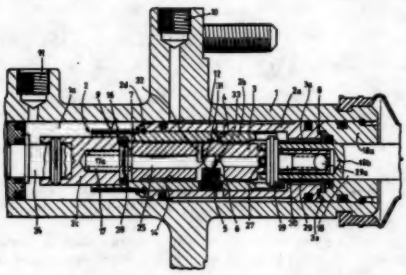
Günter Leineweber; Rolf Warnecke, both of Gifhorn, and Heinz Rühmer, Wolfenbüttel, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 30, 1985, Ser. No. 792,833

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1984, 3440292

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—373 **4 Claims**



1. In a pressure-unbalanced hydraulic amplifier valve assembly including a housing provided with a housing bore having a longitudinal axis; an amplifier piston axially slidably received in said housing bore and having an axially extending piston bore; means for maintaining a hydraulic system pressure in one part of said housing bore; means defining a control port in said amplifier piston; said control port being asymmetrical relative to a circumference of said amplifier piston; a control plunger axially slidably received in said piston bore with a sufficiently loose fit to provide for a slight radial excursion of said control plunger relative to said amplifier piston; said control plunger being arranged for cooperating with said control port; a transverse piston supported in said amplifier piston for sliding motions radially relative to said axis; said transverse piston being exposed to said system pressure; a first force-transmitting means being in engagement with said transverse piston and said control plunger for pressing said control plunger, in a zone of said control port, radially against said amplifier piston; a pressure piston axially slidably supported in said housing axially

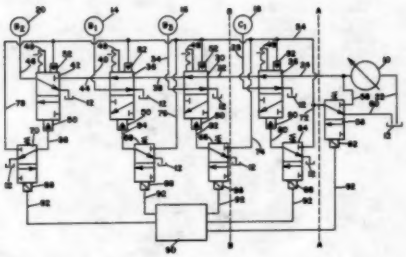
adjacent said control plunger; said pressure piston being arranged for exposure to an external axial force oriented towards said control plunger; and a second force-transmitting means for applying said external axial force from said pressure piston to said control plunger; the improvement wherein said control plunger has an inner wall defining a throughgoing axial plunger bore including an axially linear track; said first force-transmitting means comprising a ball being in contact with said transverse piston and with said track and being arranged for rolling engagement with said track; said second force-transmitting means comprising a first pin held in said pressure piston and a second pin held in said control plunger adjacent said first pin; said first and second pins being oriented transversely to one another and being in a substantially point-contact with one another; a spring means for urging said first and second pins into contact with one another; said spring means having first and second ends; and an insert placed between said first pin and said first end of said spring; said insert having a planar end face being oriented towards and in contact with said first end of said spring means; said second end of said spring being supported by said control plunger.

4,638,720

ELECTRO-HYDRAULIC CONTROL SYSTEM

Kevin D. McKee, Waterloo, and Charles W. Formwalt, Jr., Janesville, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 1, 1980, Ser. No. 211,486
Int. Cl.⁴ F15B *11/00*
U.S. Cl. 91—522 **12 Claims**



1. An electro-hydraulic control system for a hydraulic system having a plurality of functions, the control system comprising:

a plurality of two-position control valves for controlling the flow of fluid to and exhaust of fluid from the plurality of hydraulic functions;

first and second servo means associated with each control valve responsive to fluid pressure to move the control valve to first and second positions, respectively;

a two-position, solenoid-operated, reset valve for controlling the flow of fluid to and exhaust of fluid from the second servo means of the plurality of control valves; and

a two-position, solenoid-operated, pilot valve associated with each control valve for controlling the flow of fluid to and exhaust of fluid from the first servo means of the associated control valve.

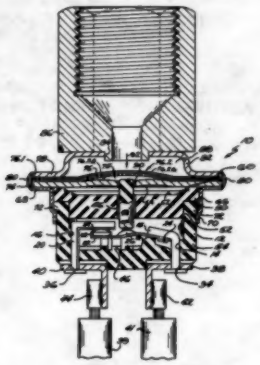
4,638,721

PRESSURE RESPONSIVE DEVICE

Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 24, 1980, Ser. No. 171,682
Int. Cl.⁴ H01H *35/34*
U.S. Cl. 92—6 D **7 Claims**

1. A pressure responsive device comprising a preformed dished metal diaphragm having a domed central part and a flange part and having the domed central part of the diaphragm joined to the flange part at a location extending in a plane to mount the diaphragm, the domed central part of the diaphragm originally having a concave side and a convex side upstanding from said plane and being adapted to move from an original dished configuration toward an inverted dished configuration to tend to pass through said plane with snap action in response to application of a selected pressure to the originally convex side of the diaphragm to perform a control function, characterized in that support means engage and mount the flange part of the diaphragm at said plane and in that a portion of the support means extends up through that plane into the space defined by the originally concave side of the original dished configuration of the domed central part of the diaphragm adjacent at least a portion of the domed central part



of the diaphragm extending around the periphery of the domed central part of the diaphragm, said portion of the support means being originally spaced from the concave side of the domed central part of the diaphragm but being disposed for intercepting and engaging said portion of the diaphragm extending around the periphery of the domed central part of the diaphragm on said originally concave side of the diaphragm within said space during such snap-acting movement to limit snap acting movement of said periphery of the domed central part of the diaphragm and to positively support and prevent movement of at least said peripheral portion of the domed central part of the diaphragm through said plane for avoiding the development of excessive stresses in that peripheral portion of the domed central part of the diaphragm.

4,638,722

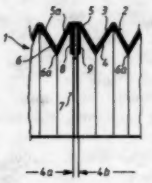
BELLOWS

Barbara Schneider, Landsham; Kurt Hennig, Munich, and Manfred Klein, Ismaning, all of Fed. Rep. of Germany, assignors to Gebr. Hennig GmbH, Ismaning, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,468
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1981, 3149428
Int. Cl.⁴ F01B *19/00*
U.S. Cl. 92—42 **19 Claims**

1. An elongate bellows comprising a pleated outer cover member and a correspondingly pleated inner cover member having confronting portions secured to each other, said inner cover member having a length greater than that of said outer

cover member, said inner cover member having its excess length taken up by longitudinally spaced apart flap-like sections that are unsecured to said outer cover member and extend transversely and inwardly of said outer cover member.



4,638,723

REDUCED PRESSURE CONTROL DEVICE FOR MOVING A MOVABLE MEMBER BETWEEN THREE POSITIONS

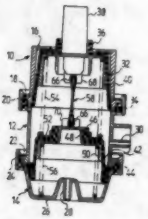
Jean-Francois Bouvot, Dampierre, and José Leborgne, Trappes, both of France, assignors to Valeo, Paris, France

Filed Aug. 1, 1984, Ser. No. 636,739

Claims priority, application France, Aug. 10, 1983, 83 13182

Int. Cl.[4] F01B *19/00*

U.S. Cl. 92—48 **5 Claims**



1. A reduced pressure control device for moving a movable member between three position, the device comprising:

a housing defined by surrounding walls including an end wall;

first and second flexible and deformable membranes fixed inside the housing to form first and second independent sealed chambers inside the housing, the first chamber extending between the first and second membranes, and the second chamber extending between the second membrane and the end wall of the housing;

a movable member extending through a wall of the housing remote from the end wall;

a first cup mounted on the first membrane and connected to the movable member to move said movable member;

a second cup mounted on the second membrane and connected to the first cup by a link having predetermined maximum and mimimum lengths;

a first spring interposed between the two cups;

a second spring interposed between the second cup and the end wall of the housing; and

first and second orifice means for connecting said first and said chambers respectively to atmospheric pressure or to a source of reduced pressure;

the improvement wherein the said link between the first and second cups is a flat single-piece strip of rigid material having opposed ends and being non-extensible and elongate in form, the strip having a portion of reduced thickness centrally between its ends defining a folding hinge, the link being capable of assuming an extended position between the first and second cups which are then separated by a predetermined maximum distance, and also being capable of assuming a folded position of greater that 90° between the cups which are then separated by a minimum distance, and a transverse disk integral with the strip at one of its ends, said strip having a second portion of reduced thickness between the strip and the disk defining a second folding hinge whereby said link is capable of assuming a folded position relative to said disk, said transverse disk having resiliently deformable tabs for snap fitting to one of the cups, said one cup including aperture means defined therethrough for receiving said resiliently deformable tabs and locking said transverse disk to said one cup, said resiliently deformable tabs being integrally formed with said transverse disk and projecting outwardly relative to said strip from peripherally spaced points about said disk, said one cup to which said tabs are snap-fitted comprising said first cup and including an annular sleeve extending outward and terminating in an open end receiving said deformable tabs therethrough, said aperture means being defined laterally through said sleeve inward of the open end thereof.

4,638,724

DEVICE FOR PRODUCING MECHANICAL FORCE BY PRESSURE OF A FLUID

Manfred Emmert, Postfach 12, 7859 Efringen-Kirchen, Fed. Rep. of Germany

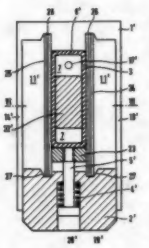
Division of Ser. No. 563,412, Nov. 29, 1983, Pat. No. 4,543,877.

This application Jun. 3, 1985, Ser. No. 740,693

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212155; May 5, 1982, 3216753; PCT Int'l Appl., Mar. 24, 1983, PCT/DE83/00055

Int. Cl.[4] F16J *1/10, 3/00;* F01B *19/00*

U.S. Cl. 92—84 **9 Claims**



1. A device for producing mechanical force by means of a pressure fluid comprising:

(a) a cylinder (1) having two side walls (9, 10) with surfaces (11, 12) which are plain-parallel to each other and having a lower side wall (8) at right angle to said two side walls (9, 10);

(b) a piston (2) in said cylinder (1) between said two surfaces (11, 12) and guided by said cylinder (1) for movements along said two surfaces (11, 12);

(c) an elastic cylindrical sleeve (3) having two opening edges, said sleeve being arranged in said cylinder (1) between said lower side wall (8) and said piston (2) with its edges in sealing contact with said two surfaces (11, 12);

(d) at least one bore (17) for said pressure fluid in one of said two side walls (9, 10) communicating with the interior (7) of said sleeve (3);

(e) flat springs (24, 25, 36) being arranged between said lower side wall (8) and said piston (2) and resting against an area of the outer surface of said sleeve (3) to deform said sleeve (3);

said flat springs (24, 25, 36) being deformed by said sleeve (3) when pressure fluid is supplied in its interior (7) increasing its volume by moving said area laterally towards said flat

springs (24, 25, 36), whereby piston (2) moves as a result of the deformation of said flat springs (24, 25, 36).

4,638,725

LIGHT ALLOY PISTON

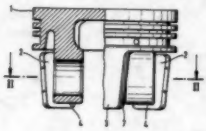
Emil Ripberger, Remseck, and Gotthard Stuska, Fellbach, both of Fed. Rep. of Germany, assignors to Mahle GmbH, Fed. Rep. of Germany

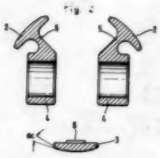
Filed Feb. 13, 1986, Ser. No. 828,789

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505037

Int. Cl.⁴ F16J 1/04

U.S. Cl. 92—237 **4 Claims**





1. A light alloy piston for internal combustion engines comprising

(a) a piston crown,

(b) a skirt depending from said crown and having external surfaces for sliding engagement within a cylinder bore,

(c) a pair of gudgeon pin bosses suspended freely on the piston crown and a skirt, which bosses except for a narrow ring land beneath the lowermost piston ring groove lying above the gudgeon pin bores, consist merely of segments covering individual partial zones of the piston circumference,

(d) two guide plates provided on one of the bearing sides of the piston as skirt elements,

(e) ribs for supporting said guide plates on the gudgeon pin boss respectively, each rib extending in the longitudinal direction of the piston, with outer surfaces adapted to the cylinder bore surface which extend circumferentially, seen from the diagonal plane lying at 45 degrees between gudgeon pin plane and connecting rod oscillation plane, each through about 15–25 degrees to both sides, and

(f) a single guide plate formed on to the ring part section of the piston head part on the opposite bearing side as a skirt element and beyond the narrow ring land lying beneath the lowermost ring groove, which guide plate reaches in the piston longitudinal direction at least to the level of the gudgeon pin axis and extends circumferentially 10 degrees to 25 degrees to each side of the plane of oscillation of the connecting rod.

4,638,726

LOAD BEARING SWAB CUP

Phil E. Johnson, and Robert K. Brock, both of Arlington, Tex., assignors to LTV Energy Products Company, Dallas, Tex.

Filed Apr. 10, 1985, Ser. No. 721,911

Int. Cl.⁴ F16J 9/00

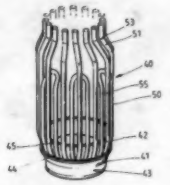
U.S. Cl. 92—241 **14 Claims**

1. An improved reinforcement cage assembly for use in the manufacture of a load lifting swab cup, said swab cup including an elastomeric material bonded to said reinforcement cage assembly, said swab cup having an axial bore therethrough and being configured to be fittably received by a supporting mandrel, said reinforcement cage assembly comprising:

(a) a metal base assembly including inner and outer ring members;

(b) a plurality of axially disposed reinforcing wire members, at least one end of each of said wire members being retained between said inner and outer ring members;

(c) a first portion of said plurality of axially disposed reinforcing wire members extending for the entire axial length of said swab cup; and



(d) a second portion of said plurality of axially disposed reinforcing wire members extending less than the entire axial length of said swab cup said second portion of said plurality of axially disposed reinforcing wire members comprising reinforcing wires configured such that both ends of each reinforcing wire of said second portion are retained between said inner and outer ring members of said base assembly.

4,638,727

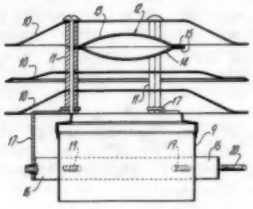
CHIMNEY COWLS

Arthur W. Mitchell, "Sandyacre", 18 Ballyardle Road, Kilkeel, County Down, Northern Ireland

Filed Aug. 22, 1983, Ser. No. 525,396

Int. Cl.⁴ F23L 17/12

U.S. Cl. 98—79 **4 Claims**



1. Means for clamping to a chimney outlet, said outlet having an outside surface, an inside surface and a top surface, a chimney cowl comprising a series of annular vanes lying in spaced horizontal planes, the uppermost and lowermost of which are parallel and substantially frusto-conical in shape, said vanes having central apertures and centered about a common axis and arranged in a predepernimed vertical spaced relationship, a plurality of supports connected to said vanes and positioned parallel to and radial of said axis, respective brackets connected to said supports, the lower two of said vanes converging toward their centers to form a venturi at their inner peripheries, and a device of aerodynamic shape mounted co-axially with the vanes and located between the upper two vanes, the device being circular in plan and masking the central apertures in the vanes and having upper and lower convex air-deflecting walls arranged base-to-base about said common axis, the upper walls of the device being parallel or substantially parallel to the uppermost and lowermost vanes, the means comprising a clamping ring formed by an annular surround spaced below and connected via said brackets to said supports beneath said lowermost vane, and having provided

therein two or more tapped bores each engaged by a screw-threaded element for urging inwardly against the outside surface of a chimney outlet whereby said cowl is mounted on said outlet without contact with or extending within the confines of the inside surface of the chimney outlet, said supports contacting said top surface and said screw-threaded elements contacting said outside surface.

4,638,728

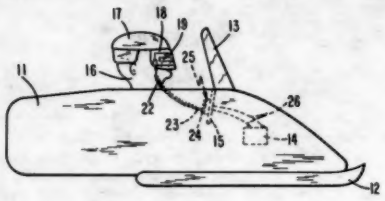
VISOR DEFROSTER

Allen Elenewski, Rte. 2, 2270 15th La., Friendship, Wis. 53934

Filed Jul. 31, 1985, Ser. No. 760,988

Int. Cl.[4] B60H *1/03*

U.S. Cl. 98—2.08 **22 Claims**



1. In combination, an optically transparent face shield adapted to be mounted on a helmet of the type worn by an outdoor open air vehicle operator, a resistance heating coil fixedly secured on a first surface of the visor, the first visor surface being the visor surface in closest proximity to the face of the operator, said coil having a tortous path that does not interfere with the field of view of the driver and including horizontally and vertically extending segments, adjacent ones of the horizontally extending segments having ends in proximity to edges of the visor and being electrically connected to each other by the vertically extending segments, an electric connector housing fixedly attached to a lower corner of the visor on a second surface of the visor opposite from the first surface, the bottom horizontally extending segment having an end terminating at and electrically connected to a first terminal of the connector housing, said end of the bottom horizontally extending segment not being connected to a vertically extending segment, the vertically extending segment connected to an end of the top horizontally extending segment on the same side of the visor as said end of the bottom horizontally extending segment having a bottom end electrically connected to a second terminal of the connector housing, the bottom end of the vertically extending segment not being connected to a horizontally extending segment, the connector housing being located to the side of and approximately at the same horizontal level as the mouth of the pertor when the shield is being worn, a cable having first and second lead wires, connector means for respectively electrically connecting one side of the first and second lead wires to the first and second terminals, a second side of the first and second lead wires respectively terminating on a center metal pin and exterior metal taps of a male electric connector jack adapted to be connected to a female electric connector jack fixedly mounted on an open air vehicle having a power supply connected to the female jack, the connections of the cable to the jack and to the connector means and the cable length and configuration being such that (a) the operator wearing the visor while the cable is connected to the connector means and the jacks so the element is energized by the power supply is able to move normally in a cockpit of the vehicle without affecting the electric connection between the jacks, the cable and the connector means, (b) the male jack pulls out of the female jack without affecting the connection of the cable to the element via the terminal means in response to a sudden force exerted on the cable, as in the case of the operator encountering an emergency, and (c) the cable is not pulled from the connector means when it contacts unavoidable obstructions.

4,638,729

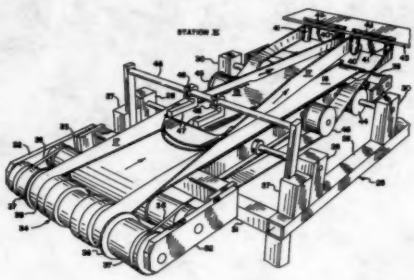
TORTILLA FOLDER

Gary C. Woodworth, Davenport, Iowa, and Gary F. Roberts, Colona, Ill., assignors to The Kartridg Pak Co., Davenport, Iowa

Filed Dec. 4, 1985, Ser. No. 804,814

Int. Cl.[4] A21C *9/00, 11/00*

U.S. Cl. 99—450.6 **6 Claims**



1. In apparatus for forming a dough sheet so as to enclose therein a foodstuff filling comprising, conveyor means and folding means for folding a dough sheet which as it is being conveyed has a leading portion, a trailing portion and opposite side portions so as to enclose a foodstuff filling deposited thereon and wherein the leading portion of the sheet as it is being conveyed is first folded over said filling with the resulting fold extending generally transversely to the conveying direction and thereafter the opposite side portions of the sheet are infolded upwardly, inwardly and downwardly with the resulting side folds extending generally parallel to the conveying direction;

infolding means comprising, in combination,

a conveyor having a generally horizontal upper run;

side belts having opposing runs extending along opposite sides of said upper run with each of said side belts runs being generally co-planar with the upstream end of said upper run of said conveyor and twisting spirally through at least 90° in an upward and inward direction so as to be inwardly convergent approaching the downstream end of said upper run; and,

stationary elongated dough sheet engaging means disposed lengthwise over said upper run of said conveyor and between said side belt runs, said dough sheet engaging means having elongated opposite side surfaces against which said side portions of said dough sheet are slidably pressed by said side belts during said infolding thereof.

4,638,730

TRASH COMPACTOR

Robert W. Bonacorsi, North Canton, Ohio, assignor to Phillips Home Products, Akron, Ohio

Filed Oct. 4, 1985, Ser. No. 784,317

Int. Cl.[4] B30B *15/06*

U.S. Cl. 100—229 A **18 Claims**

1. A trash compactor comprising, in combination:

a cabinet having upper and lower portions and adapted to rest on a floor;

a wheeled bin receivable inside the lower portion of the cabinet;

a compactor mechanism in the upper portion of said cabinet adapted to compact trash in the bin;

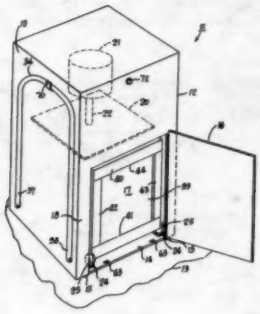
first and second wheels;

means journaling said first and second wheels on said bin;

generally vertical lost motion means acting between said journal means and said bin permitting the two wheels to be moved upwardly relative to said bin at least when said bin is in said cabinet and acted on by said compactor mechanism;

a bin support in said cabinet above the floor;

said lost motion means permitting said two wheels to be moved upwardly relative to said bin and establishing said



two wheels rollable on said bin support as the bin is pushed into the cabinet, and conversely permitting the wheels to drop downwardly a limited extent as the bin is withdrawn from said cabinet; and

reaction means acting between said bin and said journal means to establish the wheels in a downward position whereby the wheeled bin may be withdrawn from the cabinet and be supported on the wheels for rolling engagement with the floor.

4,638,731

PRESS MACHINE

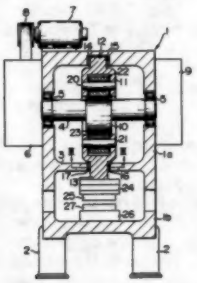
Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1985, Ser. No. 789,276

Claims priority, application Japan, Jun. 14, 1985, 60-89827[U]; Jun. 14, 1985, 60-89828[U]; Jun. 14, 1985, 60-89829[U]

Int. Cl.[4] B30B *1/06*

U.S. Cl. 100—282 **5 Claims**



1. A press machine comprising:

a frame;

a horizontal input shaft rotatably carried by said frame rotationally driven by a driving system;

a cam means including at least one cam mounted on said input shaft;

a cam follower means including a cam follower slide embracing said cam and mounted on said frame for free vertical movement, said cam follower slide being adapted to be moved reciprocatingly up and down in accordance with the rotation of said cam;

a movable die portion fixed to the lower end of said cam follower slide; and

a stationary die portion provided on the bottom of said frame for cooperation with said movable die portion;

wherein said cam has a contour which approximates a spherical regular polygon having 2n+1 apices (n being an integer) which are rounded, the surfaces of the sides of said spherical regular polygon being formed by the same curve, and

wherein said cam slide includes a hub projecting upwardly from the top thereof and a shaft projecting downwardly from the bottom thereof, said hub and said shaft being supported vertically slidably by means of metals mounted on said frame.

4,638,732

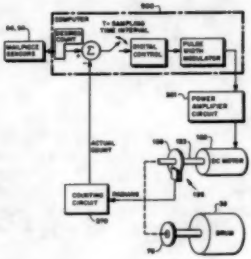
SHEET HANDLING APPARATUS

Edilberto I. Salazar, Brookfield, and Wallace Kirschner, Trumbull, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 18, 1985, Ser. No. 692,755

Int. Cl.[4] B41K *3/48, 3/64*

U.S. Cl. 101—91 **11 Claims**



1. Sheet handling apparatus comprising:

a. means for feeding a sheet in a predetermined path of travel, the sheet having a reference edge;

b. means for sensing the reference edge of the sheet in the path of travel and providing at least one sensing signal indicative of the velocity thereof;

c. rotary printing means for printing postage indicia on the sheet; and

d. means for controlling the printing means, the sensing means coupled to the controlling means, the controlling means including microcomputer means constructed and arranged to be energized from a local source of supply of power, the microcomputer means including means responsive to said at least one sensing signal for providing a time delay before commencement of operation of the printing means, the microcomputer means including means for controlling the angular velocity of the printing means in consideration of sampled increments of angular velocity thereof to cause the postage indicia to be printed on the sheet a predetermined marginal distance from the reference edge of the sheet, the controlling means including keyboard means coupled to the microcomputer means, the keyboard means including at least one key selectively operable for generating at least one key signal representative of a desired change in the marginal distance, the microcomputer means including means responsive to said key signal for providing an adjusted time delay before commencement of operation of the printing means whereby the printing means is controlled to cause the postage indicia to be printed on the sheet a changed mar-

ginal distance from the reference edge of the sheet, the changed marginal distance including the predetermined distance changed by the desired change in the marginal distance, and the microcomputer means including non-volatile memory means for storing therein an amount representative of the desired change in marginal distance when the microcomputer means is de-energized.

4,638,733

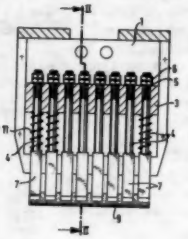
SQUEEGEE HEAD FOR PRINTING OF BODIES BY THE SCREEN PRINTING METHOD

Günther Schneider, Tettau/Langenau, and Artwin Priebisch, Stockheim, both of Fed. Rep. of Germany, assignors to Horst Rebhan, Stockheim-Wolferdorf, Fed. Rep. of Germany

Continuation of Ser. No. 572,584, Jan. 20, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 805,409

Int. Cl.⁴ B41F *15/44*

U.S. Cl. 101—114 **9 Claims**



1. A squeegee head assembly for printing by the screen printing method, said squeegee head assembly comprising an elongated squeegee rubber having a contact edge and a base edge and a holder retaining said base edge of said rubber, said holder including a plurality of clamp heads, each clamp head being connected at an individual point along the length of said base edge, said holder further including a holder mounting strip having bores therein, a plurality of holder members comprising rods mounted parallel to each other and each slidably in one of said bores for independent reciprocating movement in said bores, respectively, during a printing operation, individual biasing means mounted on each of said rods between said clamp head and said holder mounting strip to yieldingly bias said clamp heads individually in a contact direction, means connecting each of said rods to one of said clamp heads, and adjustable stop means carried by each of said rods on the end remote from said clamp head, said rubber base edge being fixed to said independently moveable clamp heads at said points along the length of said rubber, said rubber contact edge being urged thereby yieldably against a working surface, thereby being conformed to said surface during said printing operation.

4,638,734

ARRANGEMENT FOR PRINTING MACHINE PLATE CYLINDER ZERO POSITION ADJUSTMENT

Stefan Grossmann, Radebeul, and Erhard Nitzsche, Dohna, both of German Democratic Rep., assignors to EB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

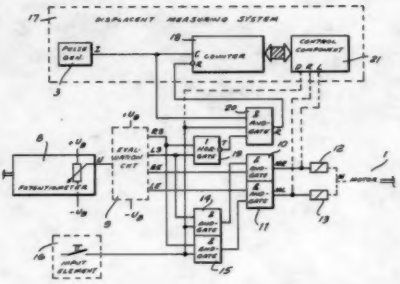
Filed Mar. 4, 1986, Ser. No. 836,235

Claims priority, application German Democratic Rep., Mar. 4, 1985, 273756

Int. Cl.⁴ B41F *13/14, 33/06*

U.S. Cl. 101—248 **3 Claims**

1. An arrangement for controlling the operation of a motor, which has a mechanical output connected by a transmission to a plate cylinder of a printing machine and electrical inputs connected to respective protection devices for the two senses of rotation of the motor, during the adjustment of the plate cylinder to a zero position, comprising potentiometer means for detecting and issuing an electrical signal representative of the instantaneous position of the transmission; an evaluation circuit having an input connected to said potentiometer means and four outputs and operative for generating and presenting at the respective ones of said outputs respective control signals for a right-hand end position, for a left-hand end position, for a right-hand switching point, and for a left-hand switching point; an input element for the zero position; a plurality of AND-gates interposed between said evaluation circuit outputs and the protection devices and connected to said input ele-



ment; an incremental displacement measuring system including a pulse generator having an output and a counter having a counting input connected to said pulse generator output and a resetting input; a NOR-gate having inputs connected to those of said outputs of said evaluation circuit which carry said switching point control signals, and an output; and another AND-gate having inputs respectively connected to said NOR-gate output, to said input element, and to said pulse generator output, and an output connected to said resetting input of said counter.

4,638,735

COMBUSTION INHIBITOR BASED ON AN ALIPHATIC POLYURETHANE ELASTOMER FOR A PROPELLANT, AND BLOCK COATED WITH THIS INHIBITOR

André E. Lelu, Saint-Medard en Jalles; Jean R. Grignon, Pessac; Bruno F. Gonthier, Saint-Medard en Jalles, and Jean-Michel Tauzia, Caychac, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed May 17, 1985, Ser. No. 735,368

Claims priority, application France, May 17, 1984, 84 07657

Int. Cl.⁴ C06B *45/28, 45/22, 45/18*

U.S. Cl. 102—290 **9 Claims**

1. Combustion inhibitor composition for a solid propelling composition, said combustion inhibitor composition comprising an aliphatic polyurethane obtained by the reaction of at least one polyisocyanate with a mixture of at least one polyfunctional polyether polyol having a molecular weight between 400 and 4500 containing at least three hydroxy groups per molecule and at least one difunctional polymer containing two hydroxy groups per molecule, the said combustion inhibitor composition incorporating a gasifiable organic filler or an aliphatic plasticizer, wherein the said difunctional polymer is selected from the group consisting of a lactone polymer having a molecular weight between 500 and 3000 and a tetrahydrofuran polymer having a molecular weight between 600 and 2,000, the molar fractions of the difunctional polymer and of the polyfunctional polyether polyol being determined by the following relationship (I):

$$R = \frac{Mx \cdot \gamma x}{fx} \cdot \frac{fy}{My \cdot \gamma y} > 1 \qquad (I)$$

in which

Mx, γx and fx, respectively, denote the molecular weight, the molar fraction and the number of OH groups per molecule of the difunctional polymer; and

My, γy and fy, respectively, denote the molecular weight, the molar fraction and the number of OH groups per molecule of the polyfunctional polyether polyol,

the proportion of the number of carbon atoms to the number of oxygen atoms in said polyurethane being greater than 4.

4,638,736

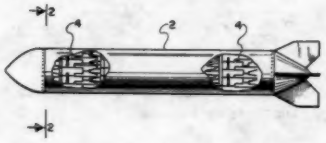
BOMBLET DISPERSION SYSTEM FOR A CLUSTER BOMB

James R. Farmer, Lititz, Pa., assignor to ISC Technologies, Inc., Lancaster, Pa.

Filed Mar. 20, 1984, Ser. No. 591,608

Int. Cl.⁴ F42B *25/02, 25/16*

U.S. Cl. 102—393 **6 Claims**



1. In a cluster bomb comprising a separable canister housing a plurality of bomblets, the canister being formed from a plurality of sections adapted to separate in flight, the bomblets being disposed within the canister to be dispersed over an area when the canister is opened, and a transmission wire arranged in a serpentine path adjacent the bomblets to transmit information signals to the bomblets, the wire being attached to at least one of the canister sections at a plurality of selected locations, the improvement comprising:

explosive means positioned adjacent the transmission wire between successive pairs of attachment locations, and

means for detonating the explosive means upon opening of the canister to sever the transmission wire between its attachment locations, and thereby enable the resulting wire sections to be pulled away from the bomblets by at least one of the canister sections.

4,638,737

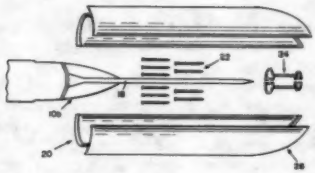
MULTI-WARHEAD, ANTI-ARMOR MISSILE

Pat H. McIngvale, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 28, 1985, Ser. No. 749,847

Int. Cl.⁴ F42B *13/04, 13/50, 15/26*

U.S. Cl. 102—489 **5 Claims**



1. A missile for defeating active armor of a target comprising a missile having a primary warhead and secondary warheads mounted at the front of the missile in nose cone sections with said primary warhead being designed to defeat basic armor of a target and said secondary warheads being designed for defeating explosive charge armor about the basic armor, said secondary warheads being mounted and clustered about a portion of said primary warhead and being encased in a portion of said nose cone sections and with a front most nose cone structure secured to said portion of said nose cone sections, and means mounting said secondary warheads, said portion of said nose cone sections and said front most nose cone structure whereby said secondary warheads can be released in flight to the target as a cluster prior to the main warhead arriving at the target to allow the secondary warheads to destroy explosive charge armor of the target prior to the main warhead delivering its blow to the basic armor of the target.

4,638,738

FIN STABILIZED SUBCALIBER SHELL OF LARGE LENGTH TO DIAMETER RATIO

Bernhard Bisping, Ratingen, and Klaus Bornefeld, Duesseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 666,181

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339078

Int. Cl.⁴ F42B *11/08*

U.S. Cl. 102—516 **12 Claims**

1. A fin-stabilized subcaliber armor piercing projectile having a large length to diameter ratio comprising

a metallic rear body,

a metallic middle body, and

a pointed front nose body, all of which are operatively joined to each other;

the middle body is made of metal of high density selected from the group of depleted uranium and tungsten of at least a density of 18 gm/cm^3, of lower ductility but higher brittleness than the metal of the rear body in a binder phase containing iron and nickel

said rear body is made of metal of high density selected from the group of tungsten and depleted uranium in a binder phase containing iron and nickel, said rear body having a density of at least 18 g/cm^3;

the volume of the middle body is substantially equal to the rear body;

the pointed front nose body consists of a metal of high ductility and density which has pyrophoric properties;

the rear body and middle body are joined to each other by butt surfaces and a metal sheathing surrounds said rear and middle bodies at these butt surfaces;

said sheathing extends only to about the middle of the middle body and has a front cutting edge;

said sheathing consists of steel;

said steel sheathing has means on its external periphery for connecting it to a sabot;

the rear body coaxially extends into said sheathing and

fin-stabilization means are mounted on said steel sheathing; and

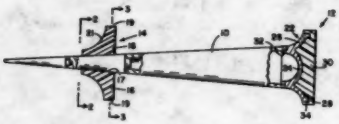
said middle body and rear body are joined by hard welding to each other.

4,638,739

SABOT FOR AN ELECTROMAGNETICALLY-ACCELERATED, UNGUIDED HYPERVELOCITY PENETRATOR

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 14, 1986, Ser. No. 829,339
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—520 6 Claims



1. A sabot arrangement for supporting a conically shaped penetrator for launching from a launch tube, said sabot arrangement comprising a forward sabot comprised of a multiplicity of equal segments having a center bore section for engaging the outer surface of the penetrator, and said segments being made of electrical and thermal insulating material, said sabot arrangement also including a base sabot that includes a metallic shell that includes three integral parts that are connected to form a unitary structure and are composed of a central spherical dome, an intermediate toroidal shell section and an outer hoop ring for supporting an outer edge of the toroidal shell section, and a rear cap fitted over the rear end of a portion of said toroidal shell section, said spherical dome and said hoop ring, said cap being made of electrical and thermal insulating material and said dome having a portion for engaging an end of the penetrator for connection thereto.

4,638,740

DEVICE FOR SELECTIVELY COUPLING A MOVABLE LOAD BEARING UNIT TO A LINK CHAIN CONVEYOR FLIGHT

Arthur B. Rhodes, 3347 Camp Ground Rd., Louisville, Ky. 40211

Filed Dec. 30, 1985, Ser. No. 814,808
Int. Cl.[4] B61B *10/04*
U.S. Cl. 104—172.2 11 Claims

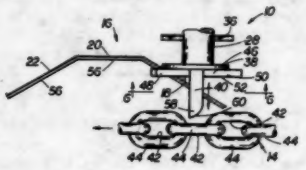
1. A device for selectively coupling and uncoupling a movable load bearing unit to a moving link chain conveyor flight comprising:

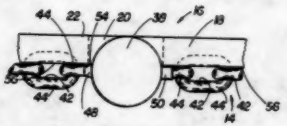
stem means attached to the load bearing unit, the stem means being movable between a raised chain conveyor flight disengaged position and a lowered chain conveyor flight engaged position;

pin means for insertion into the opening of the link chain conveyor flight, the pin means being associated with the stem means for movement therewith, and the pin means being generally rectangular in transverse cross-section;

a planar plate extending perpendicular from the pin means in a forward direction from the front side of the pin means and in a rearward direction from the rear side of the pin means, the bottom surface of the planar plate being adapted to contact the chain links of the chain link conveyor flight to the upstream and downstream sides of the opening in the chain link in which the pin means is inserted when the stem means is in the lowered engaged position; and,

a beveled surface formed in the depending end of the pin means for guiding the pin means into the opening of the





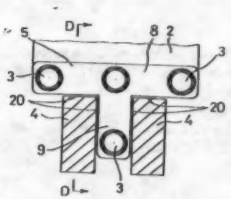
chain link as the pin means moves downwardly into the conveyor flight engaged position.

4,638,741

PRECISION ROLLER ATTACHMENT FOR AUTOMATION PROCESSION

Nobuyuki Tsuboi, 2-1, Okayama 5-Chome, Shijonawate City, Osaka 575, Japan

Filed Sep. 8, 1982, Ser. No. 415,904
Int. Cl.[4] B61B *13/04*
U.S. Cl. 105—141 8 Claims



1. A roller device for attachment to an article to facilitate the movement of said article along at least one guide line, said roller device comprising:

(a) an angular frame comprising a plurality of angular members layered in the direction of the motion of said roller device, the number of said plurality of angular members being variable to facilitate precise running of articles of differing shapes, sizes, and weights along said at least one guide line, and said frame having a plurality of recesses in its outer periphery, each aligned normally to said outer perphery, and also having a plurality of rivet holes aligned in the direction of said motion for receiving rivets to unite said angular members, and

(b) a plurality of rollers mounted in said normal recesses to roll against said at least one guide line in the direction of said motion.

4,638,742
VERTICALLY ADJUSTABLE EMERGENCY SUPPORT OF A CAR BODY

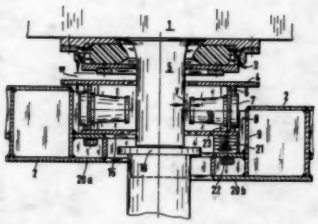
Gerd Potel, and Karl-Heinz Buchholz, both of Nuremberg, Fed. Rep. of Germany, assignors to MAN Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 698,932

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404377

Int. Cl.[4] B61F *5/16*

U.S. Cl. 105—199.3 **5 Claims**



1. A vertically adjustable emergency support for a car body having an emergency spring mounted on an underside of the car body in such a way as to be concentric relative to a center pivot; a striker plate disposed around said center pivot and provided at a distance "w" from said emergency spring; said emergency support comprising:

a box, which is disposed around said center pivot and is connected to that side of said striker plate remote from said emergency spring; said box having side plates disposed at right angles to said striker plate;

guide elements provided on those sides of said side plates remote from said center pivot;

first buffers and second rubber buffers provided on those sides of said side plates facing said center pivot, said first buffers and second rubber buffers, surrounding said center pivot with clearance in the longitudinal and transverse directions of said car body respectively;

a bogie frame likewise disposed around said center pivot, and having a rectangular cutout which is open toward said striker plate;

sliding-contact liners, on which said guide elements are movably guided in a vertical direction as provided therewith; and

means for adjustable fixing said box to said bogie frame in such a way that said distance "w" further exists between said emergency spring and said striker plate even when encountering bearing surface wear.

4,638,743
METHOD OF REINFORCING A COVERED HOPPER CAR HATCH

Russell M. Loomis, Palos Heights, Ill., assignor to Railcar Specialties, Inc., Alsip, Ill.

Filed Jul. 18, 1985, Ser. No. 756,291

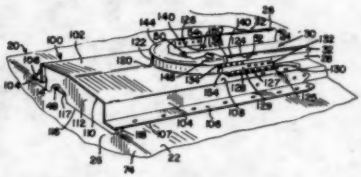
Int. Cl.[4] B61D *39/00*

U.S. Cl. 105—377 **21 Claims**

1. A process of reinforcing a railroad hopper car having a roof and a rectangular hatch opening through the roof, the hatch including a coaming upstanding from the roof peripheral of the opening and sloping inwardly of the opening, and the hatch having an end including two substantially rectangular corners, the process comprising:

A. removing a section of the roof including the end of the hatch having the two substantially rectangular corners by forming in the roof an aperture extending from said hatch opening, said removing including exposing two ends of the roof coaming that slopes inwardly of the opening;

B. covering said aperture with a planar roof sheet, said covering including aligning an arcuate "U"-shaped cut-out in one end of said roof sheet with said hatch opening to form an arcuate "U"-shaped end of said hatch opening, and said covering including abutting and joining together at two joints the two exposed ends of the roof coaming that slopes inwardly of the opening and the two opposed ends of parallel leg portions of a "U"-shaped coaming web upstanding normal from said roof sheet at said arcuate cut-out; and



C. bridging each said joint with an elongate reinforcing member, having an elongate base portion, an elongate first portion angled from said base portion and an elongate second portion extending normal to said base portion, by securing said base part of said member to both of said roof and roof sheet, securing to said roof coaming said first portion of said member upstanding from said base at the same angle that the roof coaming slopes from said roof and securing to said coaming web leg portion said second portion of said member upstanding from said base at the same angle that the coaming web stands from said roof sheet.

4,638,744
CORNER MECHANISM FOR COLLAPSABLE CONTAINER

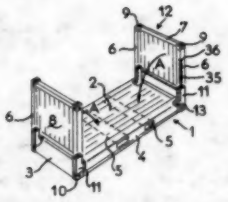
Martin Clive-Smith, 151, Broomwood Road, London, SW11 6JU, England

Filed Feb. 21, 1984, Ser. No. 581,614

Claims priority, application United Kingdom, Feb. 23, 1983, 8304952; Jun. 1, 1983, 8315092

Int. Cl.[4] B65D *19/12*

U.S. Cl. 108—56.1 **8 Claims**



1. A collapsible flat having a loading platform, a stub post extending upwardly form each corner of said loading platform and having an outer profile surface on the upper, outer edge thereof opposite a corner post pivotally mounted about a pivot axis to each tub post so that the corner post is selectively pivotable out of an upright operational position into a collapsed stowed position and vice versa, said stub post being exposed only when the corner post is collapsed, a top handling aperture in the uppermost surface of said stub post, a latching device pivotally mounted between the walls of said corner post and, in the operational position, engaging said stub post to securely hold the corner post in its upright operational posi-

tion, said latching device engaging the outer profile surface of the upper end of said stub post which is the furthest possible point on the stub post as measured diagonally from said pivot axis between the corner post and said stub post, whereby the distance between the pivot point and the latching point is maximized to reduce play in the upright corner post as much as possible.

4,638,745

TELESCOPING DISPLAY STAND

Phil B. Sheffer, New Oxford, Pa., assignor to Merchandising Innovations, Inc., Hanover, Pa.

Filed Nov. 12, 1985, Ser. No. 797,399
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—111 **9 Claims**

1. A leg assembly for a telescoping display stand wherein said leg assembly comprises,

a first lower zone (80),

said first lower zone (80) having a plurality of sections formed therein via vertical score lines (20),

at least one tab (30) formed on an outer section (11) of said first lower zone,

wherein one of the sections of said first lower zone (80) has at least one slot (40) formed therein, said slot (40) being formed at the same level as said tab (30),

a second upper zone (90) attached to said first lower zone (80) via a vertical score line (20),

said second upper zone (90) extending substantially above said first lower zone (80),

said second upper zone (90) having a plurality of sections formed therein via vertical score lines (20),

wherein one of the sections of said second upper zone (90) has at least one slot (50) formed therein, said slot (50) being formed at the same level as said tab (30) and said slot (40),

means for manually rolling said leg assembly along said vertical score lines (20) such that said at least one slot (40) in said first lower zone (80) overlies said at least one slot (50) in said second upper zone (90),

means whereby said plurality of sections are formed such that said at least one tab (30) may be inserted into said slots (40, 50) to thereby retain the leg in a locked position ready for use,

means whereby upon being in said locked position a ledge (70) is formed between said first lower zone (80) and said second upper zone (90),

said ledge (70) being formed around the entire periphery of said leg assembly when in its locked position,

wherein said leg assembly is comprised entirely of corrugated fiberboard material and requires no separate fastener elements,

wherein said plurality of sections of said second upper zone (90) are of reduced width relative to said plurality of sections in said first lower zone (80) to provide means whereby said second upper zone, upon assembly, may be slidably and securely received into a first lower zone of another identical leg assembly,

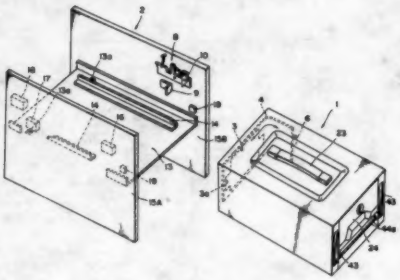
wherein said second upper zone (90) is positioned laterally of said first lower zone (80) when said leg assembly is in its flattened position.

4,638,746

DEVICE FOR AUTOMATICALLY OPENING AND CLOSING CASH CONTAINER

Kazuaki Ishigure, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 16, 1985, Ser. No. 734,664
Claims priority, application Japan, May 19, 1984, 59-101603
Int. Cl.[4] E05G *1/04*
U.S. Cl. 109—52 **7 Claims**



1. A device for automatically opening and closing a cash container having an opening, comprising:

a rack provided within a cash handling apparatus for receiving the cash container therein,

a shutter provided inside the cash container and slidable along a wall thereof for opening and closing the opening,

a knob attached to the shutter and projecting outward from the cash container,

an opening stopper engageable with the knob when the container is installed into the rack and a closing stopper engageable with the knob when the container is withdrawn from the rack, the stoppers being attached to a side plate of the rack,

a shutter lock lever engageable with a side edge of the shutter when the shutter is in its opening closing position and retainable in the engaging position by a first spring, the lever being provided within the cash container,

a slider provided slidably within the cash container for shifting the lock lever from the engaging position against the first spring,

a lock piece engageable with a portion of the slider for holding the slider immovable and provided with a first magnet, the lock piece being held in the slider engaging position by a second spring, and

a second magnet attached to the rack and operable on the first magnet when the cash container is installed into the rack to shift the lock piece from the slider engaging position.

4,638,747

COAL-FIRED ASPHALT PLANT

J. Donald Brock, Chattanooga, and James G. May, Hixson, both of Tenn., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Filed Apr. 1, 1985, Ser. No. 718,070
Int. Cl.[4] F23C *1/10*; B28C *5/06*; F23D *17/00*
U.S. Cl. 110—264 **3 Claims**

1. A coal-fired burner system for use with an asphalt plant having a rotary drum, said burner system comprising:

means for pulverizing coal to particles of a predetermined size;

exhaust means for creating an exhaust airflow through and out of said pulverizing means so that the particles of pul-

verized coal are entrained in said exhaust airflow and carried out of said pulverizing means;

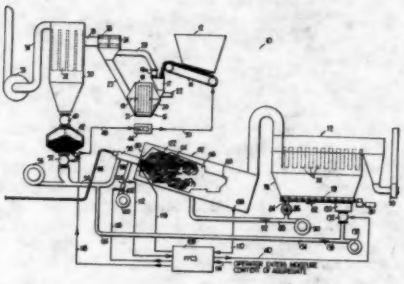
means for recovering pulverized coal particles from said exhaust airflow;

means in communication with said coal recovery means for storing said pulverized coal particles recovered from said exhaust airflow;

a burner having swirl vanes to provide a cyclonic flame pattern, mounted in one end of said rotary drum;

means for providing a primary flow of air to enter said burner substantially tangentially;

means for introducing said pulverized coal particles from said coal particle storage means into said primary airflow, whereby a mixture of air and coal is delivered into said burner;



means for providing a secondary flow of air to enter said burner substantially tangentially and to mix with said primary airflow with coal particles entrained therein;

means for controlling the rate of said secondary airflow to said burner;

means for detecting said rate of said secondary airflow;

means responsive to a change in said rate of said secondary airflow for changing the rate at which coal particles are delivered from said coal particle storage means into said primary airflow, whereby the rate at which fuel is delivered into said burner is responsive to the rate of said secondary airflow; and

means associated with said burner for igniting said mixture of primary and secondary air with coal particles entrained therein.

4,638,748

APPLICATOR AND GRAIN DRILL SHANK

Ivyl D. Kopecky, Ypsilanti, N. Dak., assignor to Haybuster Manufacturing, Inc., Jamestown, N. Dak.

Filed Jun. 7, 1985, Ser. No. 742,210

Int. Cl.[4] A01C *23/02*

U.S. Cl. 111—7 **4 Claims**

1. A shank for opening a furrow comprising:

a tubular shank portion having a furrow opening point at a lower end thereof and in a leading position relative to the direction of travel, the shank having a width defining a furrow opening in the earth;

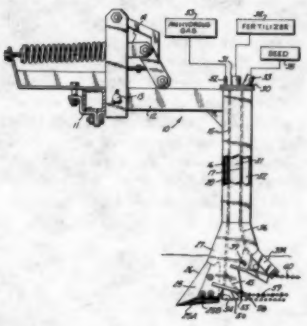
means for providing three uprightly extending passageways in said shank;

a first passageway in said shank comprising a tube carrying gaseous fertilizer material and being positioned immediately to the rear of the furrow opening point at the lowermost part of the furrow being formed, said tube having a first outlet opening at the lower end thereof;

a first sealer plate mounted on and extending laterally outwardly from and rearwardly from said shank immediately above the first outlet opening for said gaseous fertilizer material and to the rear thereof and inclining downwardly in rearward direction to cover the gaseous fertilizer with soil from the surfaces defining the furrow as the gaseous fertilizer material is discharged from the tube;

a second outlet opening leading from a second passageway of the shank immediately above said first sealer plate, said first sealer plate extending rearwardly from the first outlet opening for said gaseous fertilizer material and the second outlet opening being immediately to the rear of the first sealer plate;

a second sealer plate mounted on said shank above said second outlet opening and to the rear thereof with respect



to the direction of travel, said second sealer plate extending laterally outward from the shank and being adapted to cover material discharging from said second outlet opening with soil from surfaces of the furrow formed by the shank, and having a tapered surface means for firmly packing soil to form a packed seed bed, said second sealer plate inclining downwardly in rearward direction; and

a third of the passageways in said shank having a third outlet opening means for permitting seed to be discharged onto the packed seed bed to the rear of the second sealer plate and above the first and second outlet openings.

4,638,749

AUTOMATED SYSTEM FOR SEQUENTIALLY LOADING LOWERMOST SEGMENTS FROM A SHINGLED STACK OF LIMP MATERIAL SEGMENTS

George A. Wood, Lincoln, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 10, 1986, Ser. No. 850,237

Int. Cl.[4] D05B *21/00*

U.S. Cl. 112—121.12 **7 Claims**

1. A system for selectively loading the lowermost segment of a shingled stack of limp material segments to a seam joining apparatus, each segment including one or more adjacent layers of said limp material, wherein adjacent segments of said stack are laterally offset by a predetermined minimum distance, comprising:

A. an endless belt transport system defining a substantially planar transport surface adapted to support said shingled stack of limp material segments thereon, said belt transport system including an associated means for driving said endless belt transport system to selectively transport said stack in the direction of a reference axis,

B. detection means for detecting when the leading edge of the lowermost segment of said stack passes a reference point along said reference axis,

C. selectively operable extraction means for transporting said lowermost segment in the direction of said reference axis and away from said stack and to said seam joining apparatus,

D. selectively operable limit means for applying a limit force to one or more adjacent segments of said stack including

the next to lowermost segment but not said lowermost segment,

E. controller responsive to said detection means, said controller including means cyclically operative following the loading of a lowermost segment, for:

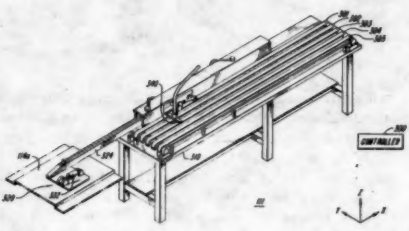
i. controlling the operation of said drive means in a cycle to advance said shingled stack in the direction of said reference axis until the leading edge of the current lowermost segment passes said reference point, and for maintaining said stack stationary otherwise during a cycle,

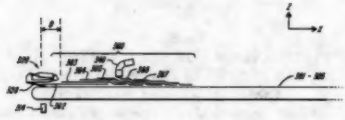
ii. during a cycle following the time when said leading edge passes said reference point, controlling said limit means to apply said limit force,

iii. in association with the initiation of the operation of said limit means in a cycle, controlling said extraction means to perform said transporting of said lowermost segment

wherein said endless belt transport system includes a plurality of substantially parallel, transversely spaced apart endless belts, the uppermost surface of said plurality of belts defining said transport surface, and

wherein said extraction means includes one or more sets of hinged jaws positioned for movement in the direction of said





reference axis and between pairs of said endless belts, said sets of jaws being adapted to selectively grip a portion of said leading edge of said lowermost segment.

4. A system for selectively loading the lowermost segment of a shingled stack of limp material segments, each segment including one or more adjacent layers of said limp material, wherein adjacent segments of said stack are laterally offset along a reference axis by a predetermined minimum distance, comprising:

A. substantially planar surface adapted to support said shingled stack of limp material segments thereon, in a position whereby the leading edge of said lowermost segment is adjacent to a reference point along said reference axis,

B. selectively operable extraction means for transporting said lowermost segment in the direction of said reference axis and away from said stack, and

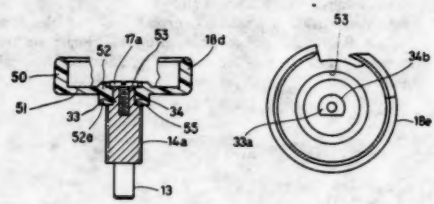
wherein said extraction means includes one or more sets of hinged jaws positioned for movement in the direction of said reference axis between said reference point and a point displaced from said reference point along said reference axis, said sets of jaws being adapted to selectively grip a portion of said leading edge of said lowermost segment when said leading edge is adjacent to said reference point.

4,638,750

SEWING MACHINE LOOP TAKER ATTACHING CONSTRUCTION

Yoshio Mikuni, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Continuation of Ser. No. 615,737, May 31, 1984, abandoned.
This application Oct. 23, 1985, Ser. No. 790,645
Claims priority, application Japan, Mar. 9, 1984, 59-34751[U]
Int. Cl.[4] D05B 57/08, 57/36
U.S. Cl. 112—230 12 Claims



1. A sewing machine loop taker attaching construction attachable to a first rotary shaft for transmitting rotation to said loop taker, said rotary shaft driven by a second shaft through meshing gears carried on said shafts, one of said meshing gears carried on said first rotary shaft being integral with said shaft, comprising a loop taker body having a base portion and a side wall projecting upward from the base portion, said base portion being formed with a central hub having a cylindrical hub wall depending downwardly below the base portion, said cylindrical hub including a socket having a cross-sectional shape in the form of a chipped circle, and a spigot formed in an upper end of the first shaft whose cross-sectional shape is substantially the same as that of said socket so that it is fitted in said socket, said meshing gear being disposed below said spigot, said spigot being of lesser diameter than said meshing gear to define an upwardly facing annular shoulder therewith, said side wall carrying a hook for arresting a needle loop, and means for removably attaching said loop taker body to said first rotary shaft, said attaching means connecting the central hub of the loop taker body to said spigot inserted with said socket with the cylindrical hub wall seated upon said shoulder and said attaching means being accessible from a top side of the loop taker body facing a sewing machine needle for fastening and unfastening the loop taker with respect to the first shaft by removal of the central hub from the spigot without interrupting the meshing state of said gears; and support means for securing said first shaft in an axially immovable position and formed separately from said attaching means to prevent interruption of the meshing state of said gears when said attaching means is operated to remove the loop taker body form the first shaft.

4,638,751

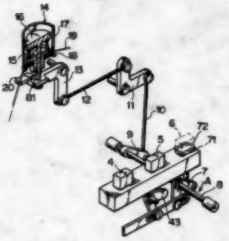
SEWING MACHINE WITH A DEVICE FOR SETTING THREAD TENSION

Susumu Hanyu; Kazumasa Hara, both of Tokyo; Akiyoshi Sasano, Musashino, and Mikio Koike, Oume, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 773,198
Claims priority, application Japan, Aug. 31, 1984, 59-180421
Int. Cl.[4] D05B 63/00, 47/02
U.S. Cl. 112—254 5 Claims

1. In a sewing machine of the type having a machine frame, means for supplying an upper thread, means for supplying a lower thread, and means for setting thread tension, the thread tension setting means comprising selecting means for selecting a thread tension in response to a thickness of a fabric being sewn and mounted to the machine frame; upper thread tension adjusting means positioned on same frame and operatively connected to said selecting means and actuated thereby to

adjust the tension of the upper thread in response to the thickness of the fabric; and lower thread tension adjusting means operatively connected to said selecting means to adjust the tension of the lower thread in response to the thickness of the fabric being sewn, said thread tension adjusting means including a cup shaped case, a spring receiving member, a spring mounted on said spring receiving member, a disk attached to said case and a first link means interconnected between said selecting means and said thread tension adjusting means, the upper thread being received between said disc and said case from the upper thread supply means.



4,638,752

SEWING MACHINE FOR PRODUCING A STITCH PATTERN

Jürgen Hartwig, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Pfaff Haushaltmaschinen GmbH, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,721

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436366

Int. Cl.⁴ D05B *3/02*

U.S. Cl. 112—458 **7 Claims**

1. A sewing machine for producing at least one stitch pattern in a workpiece, the stitch pattern consisting of a plurality of different single stitches which are formed in a sequence, comprising:

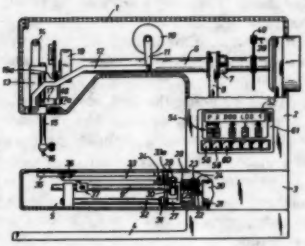
stitch forming means for forming stitches in a sequence;

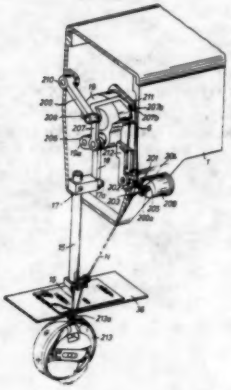
a workpiece feeding mechanism operatively connected to said stitch forming means and having a workpiece feeder, said feeding mechanism including feeder drive means for moving said feeder alternately to execute an active workpiece moving motion and an inactive return motion;

setting means connected to said drive means for varying the size and direction of the feeder motion;

a step motor connected to said setting means for setting said setting means during the inactive return motion of said feeder;

electronic control means connected to said step motor and including a read-and-write memory for receiving into storage the single successive stitches of the stitch pattern; said electronic control means also including means for controlling the displacement amount of said step motor and comparator means for comparing the displacement amount of the step motor to a selected maximum amount; and means for preventing a stitch formation from the final point of penetration of a stitch and the initial point of penetration of the successive stitch when the displacement amount exceeds the selected maximum amount.





4,638,753

RING SEGMENT SHIP HULL

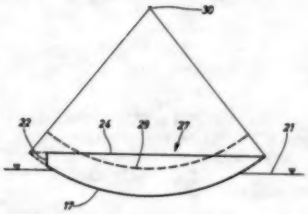
Henry Marschewski, Dürerweg 11b, D - 2190 Cuxhaven 13, Fed. Rep. of Germany

Filed Jan. 8, 1985, Ser. No. 689,673

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401908

Int. Cl.⁴ B63B *1/00*

U.S. Cl. 114—56 **8 Claims**



1. A ship's hull configuration as defined by a longitudinal keel line, and a plurality of frame lines taken at equally spaced station planes transverse to the keel line and parallel to each other, characterized by:

(a) the frame lines (10–16) defining circular arcs of equal radius,

(b) the frame lines (11–16) equidistant fore and aft from a central frame line (10) being identically configured to establish fore and aft symmetry,

(c) the keel line (17) defining a circular arc of larger radius than the frame line arcs, and

(d) center points (28) of the frame line arcs lying on a common circular arc defining a constant metacenter line (29) regardless of heel angle, said metacenter line lying in a vertical plane including the keel line, having a common center of curvature (30) with and a smaller radius of curvature than the keel line arc and being concentrically parallel thereto, and said common center of curvature defining a constant longitudinal metacenter,

(e) a submerged portion of the hull lying below a waterline (21) thus comprising a segment of a toroid having a circular cross-section.

4,638,754

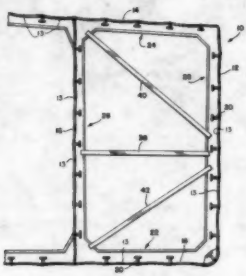
VESSEL HULL AND BULKHEADS CONSTRUCTION EMPLOYING CURVED PLATING

Edmund G. Tornay, 4 E. 95th St., New York, N.Y. 10128

Filed Mar. 27, 1985, Ser. No. 716,689

Int. Cl.⁴ B63B *3/00*

U.S. Cl. 114—79 R **6 Claims**



1. A vessel comprising sides, bottom and at least one deck, said sides, bottom and at least one deck formed of welded together rectangular steel plates, said plates being formed to a slight cylindrical curvature the axis of which is parallel to the longer of the edges of the plates, said plates having a recurved cusp portion midway between the long edges and parallel thereto, and girders welded along the recurved cusp portions parallel to the longer edges of the plates.

4,638,755

BOAT WITH A SWINGING MAST

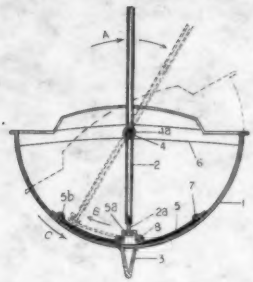
Kemal Butka, 372 Central Park West, New York, N.Y. 10023

Filed Jun. 24, 1985, Ser. No. 748,152

Int. Cl.⁴ B63B *15/00*

U.S. Cl. 114—91 **4 Claims**

1. A boat, comprising a body having a longitudinal axis; a mast arranged on said body so that under the action of a wind component acting in a lateral direction transverse to said longitudinal axis, said mast turns relative to said body clockwise or counterclockwise; and means for connecting said mast with said body so that when said mast is turned clockwise said mast forcedly turns said body counterclockwise and vice versa, said connecting means including at least two rope members each having a distal end which is connected with said body at a location laterally spaced from said mast and proximal end which cooperates with said mast so that when said mast is



turned clockwise it pulls said rope member clockwise and thereby pushes said body counterclockwise and vice versa.

4,638,756

DEVICE FOR THE POSITIONING OF TIRES

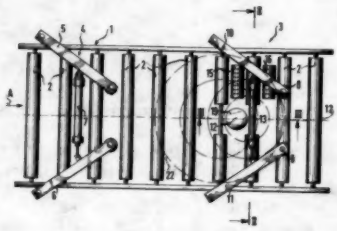
Wilhelm Collmann, Auf der Höhe 25, 2400 Lübeck, Fed. Rep. of Germany

Filed Feb. 5, 1985, Ser. No. 698,424

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406719

Int. Cl.⁴ B05C *1/02, 7/06;* **B65G** *47/22*

U.S. Cl. 118—215 **9 Claims**



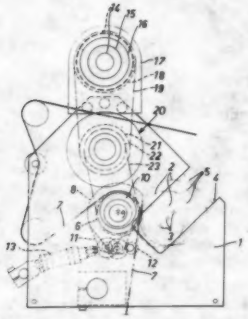
1. A device for laterally positioning a tire lying on a conveyor, which tire is conveyed individually to a station of the conveyor at which station the lying tire is aligned laterally with respect to a vertical plane of the conveyor extending in the longitudinal direction of the latter by means of stops which are movable between a position above the conveyor to block the passage of the tire thereon and a position allowing the passage of the tire, and at which station the tire is subjected to a processing step, wherein there is provided at least one rotationally symmetrical element forming a stop for the tire when said movable stops are in the position allowing the passage of the tire, said element being rotatable about its longitudinal axis lying parallel to the rotational axis of the tire lying on the conveyor and being movable between a working position in which it stops the tire and a non-working positioning allowing the passage of the tire, said station including at least one support member which is formed roller-like, laterally spaced to one side of said vertical plane, and arranged within a free region of the conveyor, and being rotatable about an axis lying at right angles to said vertical plane, and being liftable against the downwardly directed tire sidewall for the purpose of one-sided tilting of the tire and being lowerable therefrom, whereby, when said support member is lifted, rotation of the tilted tire is caused by virtue of the contact of a region of the tire sidewall still resting on the conveyor, with the conveyor.

4,638,757

APPARATUS FOR SPREADING JOINTING ADHESIVE ON A PAPER WEB WHICH MAKE ONE SIDE OF A FORM ENVELOPE

Lasse Sandgren, Kerava, Finland, assignor to Oplatek Oy, Leppavirta, Finland

PCT No. PCT/FI84/00077, § 371 Date Jun. 19, 1985, § 102(e) Date Jun. 19, 1985, PCT Pub. No. WO85/01700, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 19, 1984, Ser. No. 756,154
Claims priority, application Finland, Oct. 21, 1983, 833851
Int. Cl.[4] B05C 5/02
U.S. Cl. 118—411 9 Claims



1. In an apparatus for applying jointing adhesive to opposite sides of transverse perforations defining tear lines on a paper web, the combination comprising a rotatably mounted adhesive spreading roll; a rotatable counter roll oppositely disposed to said adhesive spreading roll; means for passing a paper web having transverse perforations at regular longitudinal intervals between said adhesive spreading roll and said counter roll; said adhesive spreading roll having two parallel arrays of adhesive dispensing nozzles with adhesive dispensing distal ends extending lengthwise of said adhesive spreading roll for applying adhesive at regular longitudinal intervals to a paper web; means for supplying adhesive under pressure to said nozzles; and means for altering the radial distance between the adhesive dispensing nozzle distal ends and the axis of rotation of an adhesive spreading roll in said apparatus whereby the interval between the application of adhesive to a paper web by said parallel arrays of adhesive dispensing nozzles is altered.

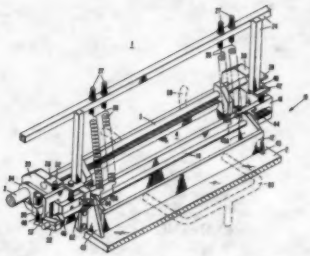
4,638,758

CAPPED PRINTING PLATE MAKING MACHINE

William Bloothoofd, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 15, 1985, Ser. No. 702,014
Int. Cl.[4] B05C 5/02
U.S. Cl. 118—412 14 Claims

1. In an automatic plate making machine where liquid photopolymerizable resin is applied to a support for making a printing plate, the improvement being said machine being capable of producing a capped printing plate, including a first trough for applying a resin layer to the support, a second trough for applying a resin layer to the support, actuating means on said first trough for engagement with complementary actuating means on said second trough whereby the actuation of said first trough for applying its resin to the support automatically causes actuation of said second trough for applying its resin to the support, said first trough being movably mounted to said second trough by means of a first mounting unit, said first mounting unit including plate means secured to said first trough, said actuating means being secured to said plate means of said first mounting unit, a second mounting unit, said second trough being secured to said second mounting unit, said complementary actuating means being secured to said second mounting unit, said complementary actuating means being disposed in the path of movement of said actuating means whereby during movement of said first mounting unit said actuating means engages said complementary actuating means to cause said second trough to be positioned and to open, said second trough having a dispensing opening formed between a back wall and a bottom wall of said second trough, said bottom wall being disposed for selective contact against said back wall



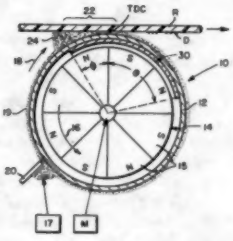
and selective movement away from said back wall, said actuating means including at least one abutment member on said first mounting unit, said complementary actuating means including at least one pressure pin on said second mounting unit disposed in the path of travel of said abutment member, said second trough being pivotally mounted on a shaft in such a manner that said second trough is rotated downward from its inactive position upon said abutment member contacting and reacting against said pressure pin.

4,638,759

MAGNETIC BRUSH APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES

Ivan B. Ville, Spencerport; James D. Walling, Fairport, and Kevin E. Yousey, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 17, 1985, Ser. No. 744,874
Int. Cl.[4] G03G 15/10
U.S. Cl. 118—657 10 Claims



1. In an electrographic development apparatus for applying a magnetically attractable developer to a latent electrostatic image-bearing surface moving along a path to render such image visible, such apparatus comprising a hollow sleeve positioned adjacent said path to define a nip region at which the outer surface of said sleeve and said image-bearing surface come into contact; a cylindrically-shaped multi-pole magnetic core rotatably mounted within said sleeve, said core comprising a plurality of magnetic pole pieces extending parallel to the core axis around the circumference thereof, said pole pieces alternating in polarity from one to the other and being closely spaced relative to said sleeve so that the magnetic field of said pole pieces extends through and beyond said sleeve; means for

supplying magnetically attractable developer to the sleeve surface; and means for rotating said magnetic core to effect movement of the developer over the sleeve surface toward said nip region at which the developer contacts said image-bearing surface and effects development of said latent electrostatic image, the improvement comprising shunt means positioned between said sleeve and said core for reducing the magnetic field produced by said magnetic core outside said sleeve in the vicinity of said nip region, whereby any tendency for the developer to move away from the developed image as such image leaves said nip region is minimized.

4,638,760

DEVELOPING APPARATUS

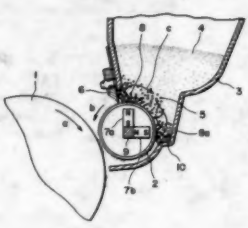
Shunji Nakamura, Kawasaki; Fumitaka Kan, Yokohama; Hidemi Egami, Zama; Atsushi Hosoi, Tokyo; Hatsuo Tajima, Matsudo, and Kimio Nakahata, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 594,863, Mar. 29, 1984, Pat. No. 4,563,978. This application Jul. 25, 1985, Ser. No. 759,110

Claims priority, application Japan, Apr. 8, 1983, 58-61852; Apr. 8, 1983, 58-61854; Apr. 8, 1983, 58-61855; Apr. 18, 1983, 58-68645

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—658 **35 Claims**



1. A method of sealing a developing device which has a developer container for containing developer including magnetic particles and non-magnetic toner particles, a developer carrying member disposed in an opening of the container and rotatable so that its surface travels out of the container at an outlet portion adjacent an upper part of the opening and travels into the container at an inlet portion adjacent a lower part of the opening and a regulating member, disposed adjacent the outlet portion, for regulating passage of the developer through the outlet to outside of the container, said method comprising:

forming a magnetic field between a stationary magnet disposed in the developer carrying member and extending codirectionally with a rotational axis of the developer carrying member and a stationary magnetic member which is disposed between the container and the developer carrying member without contact with the surface of the developer carrying member at such a position to be cooperable with the stationary magnet, whereby a relatively soft and low density magnetic brush is formed, wherein the magnetic brush prevents the developer from leaking out of the container in a direction opposite to a direction of movement of the developer carrying member and allows the developer traveling back to the container to enter the container.

4,638,761

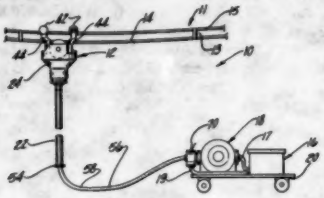
APPLICATOR FOR COATING SUSPENDED CABLE

Lee Carrick, 2 Jefferson Ct., Grosse Pointe, Mich. 48230

Continuation-in-part of Ser. No. 628,857, Jul. 9, 1984, abandoned. This application Apr. 12, 1985, Ser. No. 722,791

Int. Cl.[4] B05C *1/08, 5/00*

U.S. Cl. 118—694 **27 Claims**



1. An applicator for applying a flowable coating to a suspended cable comprising:

a supply reservoir,

an open top housing defining a coating reservoir therein,

fluid passage means between and in fluid communication with said supply and coating reservoirs for supplying said coating reservoir with the coating and for draining the coating from said coating reservoir,

said fluid passage means comprising a conduit means for defining a single flow passageway in fluid communication with said supply and coating reservoirs, said passageway being the sole fluid means for supplying and draining fluid to and from said coating reservoir,

means for selectively maintaining a predetermined level of fluid in said coating reservoir,

a coating roller having a circumferential groove adapted to receive the cable therein, and

means for rotatably supporting said roller in said housing so that at least a portion of said roller is immersed in said coating reservoir.

4,638,762

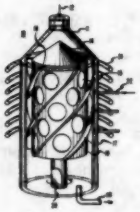
CHEMICAL VAPOR DEPOSITION METHOD AND APPARATUS

Myung K. Kim, Plainsboro Township, Middlesex County, and Montri Viriyayuthakorn, Hamilton Township, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Aug. 30, 1985, Ser. No. 770,906

Int. Cl.[4] C23C *13/08*

U.S. Cl. 118—725 **6 Claims**

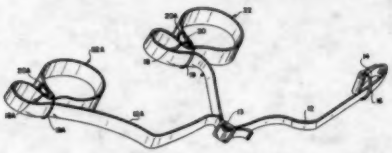


1. A chemical vapor deposition apparatus comprises a susceptor confined within a housing to form a deposition chamber, a plurality of gas inlet orifices for the entry of gases into the chamber, a gas outlet orifice to expel gases from the chamber, means for heating the susceptor and means for rotating the susceptor, wherein the susceptor includes means for supporting a plurality of substrates around the susceptor and a plurality of helical baffles extending from a top region of the susceptor to a bottom region of the susceptor.

4,638,763
ANIMAL LITTER FORMULATION
Bernard Greenberg, 89-19 32nd Ave., E. Elmhurst, N.Y. 11369
Filed Apr. 10, 1985, Ser. No. 721,672
Int. Cl.[4] A01K *1/015*
U.S. Cl. 119—1 9 Claims

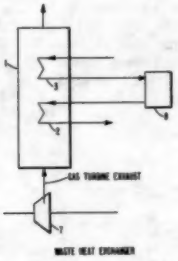
1. In a litter for accumulation of animal feces and urine, the improvement comprising the addition to the base material of the litter of an effective amount of anhydrous sodium sulfate.

4,638,764
SECURITY SYSTEM
Sharon K. Anderson, 5608 N. Roosevelt, Loveland, Colo. 80537
Filed May 20, 1985, Ser. No. 735,755
Int. Cl.[4] A62B *35/00*
U.S. Cl. 119—96 7 Claims



1. A security system adapted to secure two children to an adult, said security system comprising (a) a first length of flexible strap having first and second ends, and (b) a second length of flexible strap having first and second ends; wherein said first end of said second strap is secured to said first strap; wherein said first end of said first strap is adapted to form a first loop which is capable of being detachably fastened to said adult; wherein said second ends of said first and second straps each comprise a loop which is adapted to be detachably secured around the wrist of one of said children; and wherein each said second loop of said first and second straps is adapted to maintain a fixed diameter after being placed around the wrist of one of said children.

4,638,765
HEAT RECOVERY SYSTEM
Geoffrey F. Skinner, Reading, England, assignor to Foster Wheeler Energy Corporation, Livingston, N.J.
Filed Oct. 24, 1985, Ser. No. 791,175
Int. Cl.[4] F22D *1/00*
U.S. Cl. 122—7 R 13 Claims

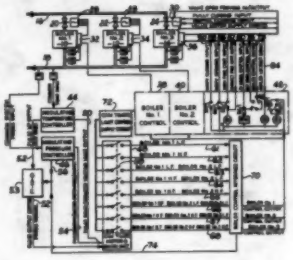


1. A process for recovering heat from gas turbine exhaust comprising passing said exhaust through a waste heat exchanger consisting of a high pressure steam superheater and a high pressure feedwater heater where said exhaust gas first contacts said high pressure steam superheater and then contacts said high pressure feedwater heater.

4,638,766
PROCESS FOR THE TREATMENT OF BOILER CONDENSATE
Graham Bunch, Aldershot, and Richard G. Dawes, Cove, both of England, assignors to The British Petroleum Company p.l.c., London, England
Filed Feb. 28, 1986, Ser. No. 834,954
Claims priority, application United Kingdom, Mar. 7, 1985, 8505870
Int. Cl.[4] F22B *37/48*; F22D *5/00*
U.S. Cl. 122—398 4 Claims

1. The process for preparing boiler feed water which comprises subjecting a boiler condensate to a step of removing insoluble oil, and then passing the condensate under elevated pressure into contact with one side of a reverse osmosis membranes the other side of which is maintained at a lower pressure, recovering purified water from said other side of the membrane, and recycling the purified water to the boiler feed.

4,638,767
HEATING SYSTEM
Martin C. J. George, Great Barr, England, assignor to Stone Allen Limited, Princes End, England
Filed Jul. 8, 1985, Ser. No. 752,943
Int. Cl.[4] F22D *37/42*
U.S. Cl. 122—448 B 2 Claims

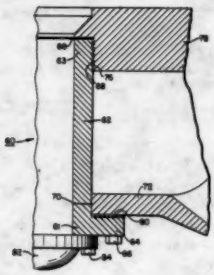


1. A heating system having a plurality of boilers, a flow main and a return main across which the boilers are connected in parallel, a separate control valve for each boiler, interposed in the flow path through the boiler, said valve having a wide-open position, a partly open position and a closed position, a control for placing the valve in its partly open position when its boiler is not being fired, and a thermostatic control responsive to the temperature of the water leaving the boiler for closing the valve when the temperature has fallen to a preset value.

4,638,768
STEAM GENERATOR TUBESHEET/CHANNEL HEAD/CENTERSTAY ASSEMBLY
Todd M. Wetherill, Fawn Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 4, 1985, Ser. No. 720,206
Int. Cl.[4] F22B *17/02, 37/10*
U.S. Cl. 122—512 10 Claims

1. A tubesheet/channel head/centerstay assembly for a steam generator, comprising:
(a) a tubesheet having a threaded internal portion formed therein;
(b) a channel head located adjacent the tubesheet having an opening formed therein; and
(c) a hollow centerstay having an external threaded portion

formed therein corresponding to the threaded portion of the tubesheet,



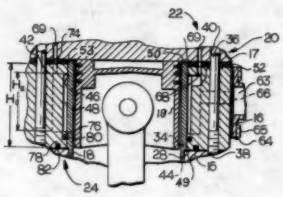
wherein the threaded centerstay is screw-inserted to join the channel head and the tubesheet and to reinforce the tubesheet under pressure against the channel head.

4,638,769

ENGINE HAVING A MULTIPIECE CYLINDER BLOCK

Benny Ballheimer, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 18, 1985, Ser. No. 712,501
Int. Cl.[4] F02F 1/16
U.S. Cl. 123—41.84 **19 Claims**



1. An engine including a multipiece block and a cylinder head, said multipiece block having a bottom block portion having a bore therein, comprising:

a top block portion positioned between the bottom block portion and the cylinder head and having a bore substantially coaxial with the bore in the bottom block portion;

means for attaching the cylinder head to the bottom block portion; and

a removable midsupported cylinder liner having an end contacting the cylinder head, an upper portion positioned within the bore of the top block portion and a lower portion extending into the bore of the bottom block portion and an annular support surface positioned between the upper portion and the lower portion, said support surface seating on the bottom block portion and said end and said support surface of the midsupported cylinder liner being fixedly biased between the cylinder head and the bottom block portion.

4,638,770

PORTING SYSTEM FOR TWO CYCLE INTERNAL COMBUSTION ENGINES

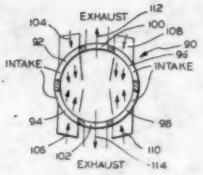
Duke Fox, 5305 Towson Ave., Ft. Smith, Ark. 72901

Filed Sep. 13, 1985, Ser. No. 775,588
Int. Cl.[4] F02B 75/40
U.S. Cl. 123—65 P **6 Claims**

1. A porting system for two cycle engines comprising a cylinder having two exhaust ports positioned on diametrically opposed sides of the cylinder, four intake ports, one of said intake ports being positioned on each of the four opposite sides of said two exhaust ports, and means for feeding an incoming stream of a fuel mixture through each of said intake ports, each of said incoming streams being fed into said cylinder directly toward another individually associated stream on the same side of said exhaust ports and with sufficient velocity to cause turbulence in areas where said incoming streams collide, the intake streams having sufficient velocity to produce a laminar flow which preludes a mixing of intake and exhaust streams.

4. A method of scavenging a cylinder of a two-cycle engine, said method comprising the steps of:

forming six ports in the walls of said cylinder, two of said ports being diametrically opposed to each other, the other four ports being formed on opposite sides of said two ports;



directing a plurality of incoming streams of a fuel mixture through said four ports, pairs of said incoming streams being directed toward each other within said cylinder, a space in the center of the cylinder remaining between said incoming streams;

giving said incoming streams a velocity which is sufficient to cause turbulence in the area where the incoming streams collide, said velocity also being sufficient to producing a laminar flow along at least the edges of incoming streams confronting said center space between said incoming streams;

said colliding streams rising within said cylinder striking the top of said cylinder, mushrooming, and descending into said center space between said incoming streams; and

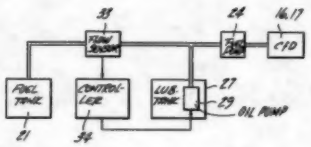
said exhaust ports being positioned at opposite ends of said center space for enabling said descending stream to exit said port.

4,638,771

LUBRICATING SYSTEM FOR TWO-CYCLE INTERNAL COMBUSTION ENGINE

Atsushi Mori, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 660,748, Oct. 15, 1984, abandoned. This application May 27, 1986, Ser. No. 868,203
Claims priority, application Japan, Oct. 24, 1983, 58-197659
Int. Cl.[4] F02B 33/04
U.S. Cl. 123—73 AD **14 Claims**



1. In a lubricating system for a two-cycle internal combustion engine having a fuel feed system including charge forming means and means for delivering fuel from a fuel source to said charge forming means and a lubricant system for the engine,

the improvement comprising means for measuring the amount of fuel supplied to said charge forming device and means for supplying lubricant to said engine lubricating system at a rate determined only by the measured amount of fuel supplied.

4,638,772

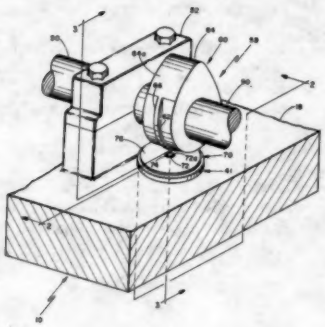
VALVE ACTUATING APPARATUS FOR MINIMIZING THE NEED FOR LASH ADJUSTMENT

Corliss O. Burandt, Plymouth, Minn., assignor to Investment Rarites, Incorporated, Minneapolis, Minn.

Continuation of Ser. No. 595,302, Mar., 1984. This application Jan. 25, 1985, Ser. No. 693,847

Int. Cl.[4] F01L *1/04*

U.S. Cl. 123—90.6 14 Claims



1. Apparatus for actuating a valve member relative to a valve seat associated with a combustion chamber of an internal combustion engine comprising a cam unit rotatable about an axis spaced from said valve seat, said cam unit including a lobe portion and ramp portions having a reduced width in relation to the width of said lobe portion, said ramp portions extending in opposite angular directions from said lobe portion, and cam follower means associated with said valve member having a generally flat working surface engageable by said reduced width ramp portions and said lobe portion, said cam follower means including a follower portion no wider than said reduced width ramp portions, said lobe portion spanning said follower portion and spanning a portion of said working surface to one side of said follower portion.

4,638,773

VARIABLE VALVE LIFT/TIMING MECHANISM

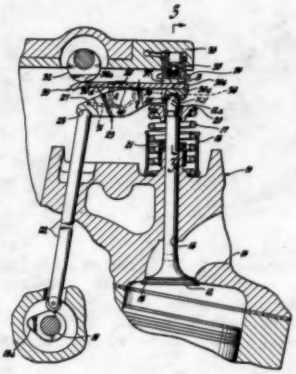
Duane J. Bonvallet, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1986, Ser. No. 834,791

Int. Cl.[4] F01L *31/14*

U.S. Cl. 123—90.16 3 Claims

1. A valve train for an internal combustion engine of the type having a body means defining a cylinder with a port, said valve train including a valve with an axial extending valve stem located for axial movement in said port and normally biased to a predetermined position; a valve actuator spaced from said valve and operable to effect reciprocation of said valve; a rocker arm pivotably supported at one end on said valve stem and at its other end engaging said valve actuator; said body means including a fixed overhead support means extending over said rocker arm and spaced therefrom a predetermined distance; a lash adjuster including a plunger means operatively positioned in said overhead support means with said plunger means having an outboard end projecting toward said valve stem in substantial coaxial alignment therewith, a pivotable eccentric means operatively located in said overhead support means so as to substantially overlie said other end of said rocker arm, an upper reaction member pivotably supported at one end by said outboard end of said plunger means, the opposite end of said upper reaction member being adapted to be engaged by said eccentric; and a spring means operatively associated with said rocker arm and with said upper reaction member to bias said opposite end of said upper reaction member into engagement with said eccentric and to bias said other



end of said rocker arm into engagement with said valve actuator; said upper reaction member and said rocker arm having opposed working surfaces one of which is flat and the other of which has a cam surface contour terminating at spaced apart points A and B on said rocker arm, said cam surface contour being in accordance with the following equation

$$y = a\frac{c - v}{l} + v$$

wherein:

v=maximum valve lift

c=cam lift

a=position of cam surface contact with the working surface of the upper reaction member

l=distance between the pivot axis of the valve actuator and said valve stem relative to the rocker arm connecting one end of the vertical lines representing c and v

y=height above a straight line extending between the opposite end of the lines representing c and v.

4,638,774

VALVE ACTUATING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Kazuo Aoi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 11, 1985, Ser. No. 743,601

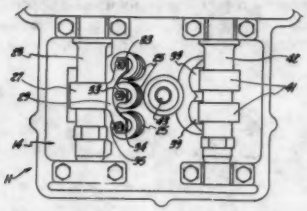
Claims priority, application Japan, Jun. 12, 1984, 59-119183

Int. Cl.[4] F01L *1/26*

U.S. Cl. 123—90.22 6 Claims

1. In an internal combustion engine having a cylinder head defining at least in part with a cylinder bore a combustion chamber, a set of a plurality of intake valves supported by said cylinder head at one side of a plane containing the axis of said cylinder bore for controlling the flow of an intake charge into said combustion chamber, a set of a plurality of exhaust valves supported by said cylinder head at the other side of said plane for controlling the flow of the exhaust charge from the combustion chamber, first and second cam means disposed on

opposite sides of said plane, means for directly operating the valves of one of said sets from said first cam means, and rocker



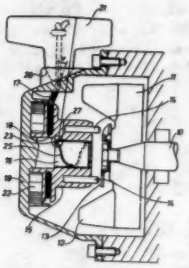
arm means for operating the valves of the other set from said second cam means.

4,638,775

HAND-ACTUATED ENGINE STARTER

Fred B. Lindström, Jönköping, Sweden, assignor to AB Electrolux, Stockholm, Sweden

Filed Aug. 9, 1985, Ser. No. 764,016
Claims priority, application Sweden, Aug. 23, 1984, 8404205
Int. Cl.[4] F02N 3/00
U.S. Cl. 123—185 G **6 Claims**



1. In a hand-actuated starter for an internal combustion engine wherein a first clutch member is journalled on a first shaft and a second clutch member is mounted on an engine shaft, the first clutch member having a pulley and being axially displaceable with respect to said second clutch member in response to rotation of said pulley, the first shaft and first clutch member having first and second mutually engaging bearing surfaces respectively; the improvement wherein one of said surfaces has threads and the other of said surfaces has a helical groove and a helical spring in said groove positioned to engage said threads, said spring being radially displaceable in said groove.

4,638,776

ROTARY INTERNAL COMBUSTION ENGINE

William Crittenden, Salt Lake City, Utah, assignor to Matt Biljanic, Salt Lake City, Utah

Filed Apr. 1, 1985, Ser. No. 718,843
Int. Cl.[4] F02B 53/04
U.S. Cl. 123—235 **10 Claims**

1. An improved rotary internal combustion engine comprising:

(a) a combustion chamber which is generally circular in cross-section and which has a ring-like peripheral wall;

(b) a driven shaft member journaled for rotation and disposed to pass eccentrically through the combustion chamber;

(c) a compression chamber which is generally circular in cross-section positioned with a ring-like wall is adjacent to and spatially offset with the combustion chamber such that the driven shaft passes centrally therethrough;

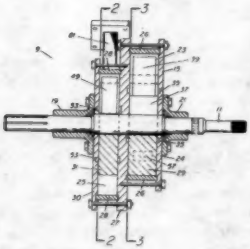
(d) a circular combustion rotor fixed concentrically to the shaft member for rotation eccentrically within the combustion chamber, the combustion rotor being positioned such that the space between the periphery of the rotor and the periphery of the combustion chamber results in a crescent shape;

(e) a circular compression rotor fixed concentrically to the shaft member for rotation eccentrically within the compression chamber, the compression rotor being positioned such that the space between the periphery of the rotor and the periphery of the compression chamber results in a crescent shape which is in a generally opposed relationship with said crescent shape formed in the combustion chamber;

(f) a first radial slot means formed radially through the compression rotor;

(g) a first circular guide track formed within a sidewall of the compression chamber concentric with the axial centerline thereof;

(h) a first piston-vane disposed within the first radial slot means and in mechanical communication with the first circular guide track such that the first pistonvane moves reciprocatively relative to the compression rotor as the same rotates within the compression chamber, the first



piston-vane being dimensioned such that its distal end is in sliding engagement with the peripheral wall of the compression chamber;

(i) a second radial slot means formed radially through the combustion rotor;

(j) a second circular guide track within the sidewall of the combustion chamber concentric with the axial centerline thereof;

(k) a second piston-vane disposed within the second radial slot means and in mechanical communication with the second circular guide track such that the second pistonvane moves reciprocatively relative to the combustion rotor as the same rotates within the combustion chamber, the second piston-vane being dimensioned such that its distal end is in sliding engagement with the peripheral wall of the combustion chamber;

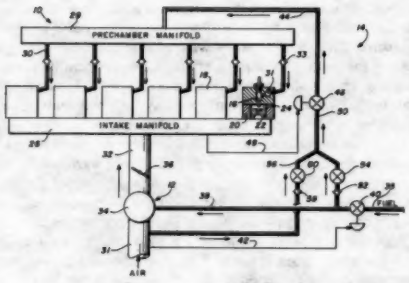
(l) a port means for providing a communicative gaseous flow between the compression chamber and the combustion chamber, the port means being formed and located within the compression chamber such that the compression rotor blocks the flow of compressed gases into the port means except when the first radial slot means is in registry with the port means, and the port means being located within the combustion chamber such that the combustion rotor blocks the flow of compressed gases into the combustion chamber except when the second radial slot means is in registry with the port means.

4,638,777

PRECHAMBER FUEL CONTROL SYSTEM

John C. Fanner, Fridley, Minn., and Warren E. Snyder, Elm Grove, Wis., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 5, 1984, Ser. No. 658,001
Int. Cl.[4] F02M 21/04
U.S. Cl. 123—277 10 Claims



1. An improved method of fuel control for a gaseous fueled internal combustion engine that includes a prechamber for each of a plurality of combustion chambers, an ignition system for igniting the fuel, and an intake manifold connected with each combustion

chamber, the improved method comprising the steps of:

supplying fuel gas to the prechambers at a pressure not less than intake manifold pressure;

simultaneously supplying a fuel gas and air mixture to the combustion chambers;

igniting the gas in said prechambers to ignite the gas and air mixture in said combustion chamber;

supplying a fuel gas and air mixture to said prechambers at a pressure higher than the pressure of the fuel gas initially supplied thereby stopping flow of fuel gas alone to said prechambers;

varying the pressure of said fuel gas and air mixture in accordance with the intake manifold pressure; and,

simultaneously controlling the mixture of fuel gas and air supplied to the prechambers.

3. An improved prechamber fuel system for a gaseous fueled engine including a prechamber for each of a plurality of cylinders; a reciprocating piston located in each cylinder; a head closing one end of each cylinder; said head, cylinders and pistons forming a plurality of combustion chambers; an intake manifold connected with each combustion chamber; a source of pressurized fuel gas; a source of combustion air; and, each said prechamber having ignition means therein, the improvement comprising:

a prechamber manifold connected with each prechamber;

conduit means connecting said prechamber manifold with the source of combustion air and with the source of pressurized fuel gas;

flow control means in said conduit means for controlling the ratio of fuel gas to air; and,

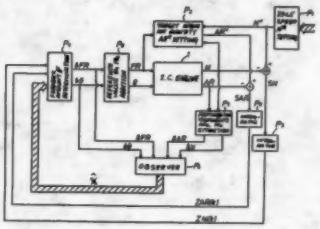
pressure control means in said conduit means for regulating the pressure of said fuel gas and air relative to the pressure in said inlet manifold.

4,638,778

IDLE SPEED CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Eiichi Kamei, Nagoya, and Hideaki Namba, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 19, 1986, Ser. No. 830,935
Claims priority, application Japan, Feb. 19, 1985, 60-31265
Int. Cl.[4] F02D 11/10
U.S. Cl. 123—339 2 Claims



1. Apparatus for controlling an internal combustion engine equipped with one or more fuel injection valves, comprising:

(a) a throttle actuator for adjusting opening degree of a throttle valve disposed in an intake pipe of said engine;

(b) engine speed detecting means for producing a first signal indicative of the rotational speed of said engine;

(c) intake air quantity detecting means for producing a second signal indicative of the intake air quantity sucked by said engine; and

(d) an electronic control means responsive to said first and second signals for producing and supplying fuel injection valve drive signals to said fuel injection valves and for producing and supplying throttle actuator drive signal to said throttle actuator, said electronic control means having a target idle speed setting unit, said electronic control means also having:

(i) a target intake air quantity setting unit for determining a target intake air quantity corresponding to minimum fuel amount with which the rotational speed of said engine can be maintained at said target idle speed, on the basis of fuel injection amount-intake air quantity correlation pattern which is predetermined in accord with said target idle speed; and

(ii) an integral-added optimal regulator for determining feedback amounts respectively in connection with the amount of fuel to be injected and the opening degree of said throttle valve in receipt of said target idle speed and said target intake air quantity on the basis of predetermined operating formulas used for estimating the internal state of said engine which formulas are determined in accordance with a dynamic model of the system relating to the operation of said engine, and an optimal feedback gain, and for outputting said fuel injection valve drive signals and said throttle actuator drive signals which are produced acccording to said feedback amounts thus determined.

4,638,779

APPARATUS FOR CONTROLLING AN ENGINE IN A HYDRAULICALLY DRIVEN VEHICLE

Tomowo Kitada, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

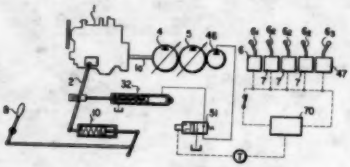
Filed Mar. 28, 1985, Ser. No. 717,070
Claims priority, application Japan, Mar. 30, 1984, 59-45113
Int. Cl.[4] F02M 39/00
U.S. Cl. 123—385 1 Claim

1. An apparatus for controlling the internal combustion engine of a hydraulically driven vehicle comprising:

a transmission mechanism for transmitting the operation of a

fuel control lever to a governor control lever and having a loose spring mechanism with a loose spring therein:

a hydraulic decelerator cylinder connected to said transmission mechanism and having a spring and piston therein, said deceleration cylinder spring having a slightly larger spring force than said loose spring in said loose spring mechanism and applying a force absorbing action, in the absence of hydraulic force acting on said piston, to set said governor control lever in its deceleration position when said fuel control lever is moved to its full engine speed position and for moving said governor control lever to its full engine speed position when hydraulic force is applied to said piston;



an electromagnetic valve for applying fluid pressure from a control pump driven by said engine to said piston in said decelerator cylinder and releasing said fluid pressure; and

an electric circuit including a plurality of switches operationally associated with levers for operating a hydraulic valve for controlling the swinging of the vehicle, a hydraulic valve for controlling the operation of a work machine on the vehicle and a hydraulic valve for controlling the travel of the vehicle, respectively and for opening and closing said electromagnetic valve, said electric circuit including time delay means for delaying the operation of said electromagnetic valve several seconds after said switches have been turned off and said operating levers are all in their neutral positions.

4,638,780

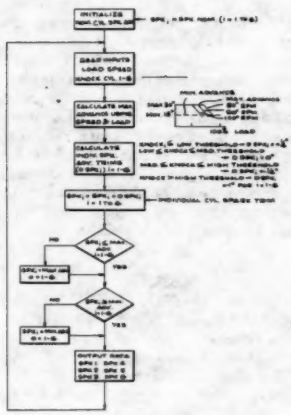
INDIVIDUAL CYLINDER IGNITION CONTROL

Lahn T. Trinh, and Thomas E. Lewis, both of San Diego, Calif., assignors to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 593,457, Mar. 26, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 779,895

Int. Cl.[4] F02P *5/00, 5/14*

U.S. Cl. 123—416 **12 Claims**



1. An ignition system for providing individual cylinder spark control for multicylinder engines including a shaft encoder directly connected to the engine crankshaft, said encoder producing a large number of encoder pulses per engine revolution (NC), means connected to said shaft encoder producing a single timing reference pulse every other shaft revolution at the same reference shaft position, a first counter connected to receive said timing reference pulses and said encoder pulses (NC) and to produce a carry pulse after every N counts where N is equal to 2NC/number of cylinders of said engine and N counts thus represents the theoretical crank angle between successive cylinder reference shaft positions,

second and third counters connected to receive each carry pulse, said second counter delaying said carry pulse by a fixed number of encoder output pulses to produce a maximum timing advance, said third counter being incremented one step for each carry pulse and being also connected to be reset by each timing reference pulse to synchronize said third counter with engine rotation,

memory means having a plurality of memory locations containing code information representing actual measured individual offset crankshaft angles for each individual cylinder of the engine being controlled,

a variable delay counter and means connecting said second counter to said memory means and to said variable delay counter to cause said memory means to unload a code number to said variable delay counter corresponding to the cylinder indicated by said third counter, each said code number being delayed by said maximum timing advance, said variable delay counter thereby producing ignition pulses for each cylinder in which the timing is retarded from said maximum timing advance as defined by its corresponding code number.

4,638,781

FUEL CUT-OFF DEVICE FOR INTERNAL COMBUSTION ENGINE

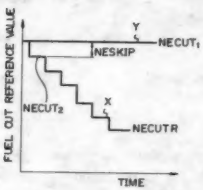
Kazuhiro Shiki, Okazaki, and Takao Iura, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 5, 1985, Ser. No. 772,639

Claims priority, application Japan, Sep. 7, 1984, 59-187821

Int. Cl.[4] F02D *41/12*

U.S. Cl. 123—493 **8 Claims**



1. A fuel cut-off device for an internal combustion engine having a fuel supply means into the engine, said device comprising:

a first detecting means for detecting the rotational speed of the engine;

a second detecting means for detecting a racing condition of the engine;

a means for determining a fuel cut-off reference value in response to an output of said second detecting means to provide a first predetermined value at a relatively higher engine revolution range than a normal operation range when the engine is in a loaded condition and a second predetermined value below said first predetermined value when the engine is in a racing condition; and

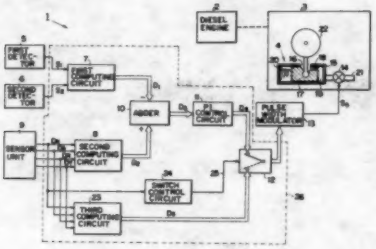
a fuel cut-off means for cutting the supply of the fuel into the engine in response to an output of said first detecting means when the rotational speed of the engine is above said fuel cut reference value.

4,638,782

APPARATUS FOR CONTROLLING FUEL INJECTION TIMING IN A FUEL INJECTION PUMP

Seishi Yasuhara, Yokohama; Mitsuo Hagiwara, Higashimatsuyama; Kazuo Inoue, Higashimatsuyama; Kyoichi Fujimori, Higashimatsuyama; Akira Sekiguchi, Higashimatsuyama, and Hiroshi Okada, Isezaki, all of Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Jan. 10, 1984, Ser. No. 569,673
Claims priority, application Japan, Jan. 11, 1983, 58-2592
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—502 12 Claims



1. An apparatus for controlling the timing of injection of fuel supplied to an internal combustion engine from a fuel injection pump having a member for adjusting the timing of injection of fuel, said apparatus comprising:

means for operating said member;

a first means for generating a first signal relating to the actual timing of injection of fuel supplied from said fuel injection pump;

a second means for generating a second signal relating to the target timing of injection of fuel determined by the condition of operation of said internal combustion engine;

means responsive to said first and second signals for generating an actuating signal for driving said operating means so as to make said actual timing of injection coincident with said target timing of injection by closed loop control;

a third means for producing a third signal for driving said operating means, said third signal being representative of a normal operating condition of the engine but unrelated to said actual timing of injection;

means for detecting whether or not said internal combustion engine is being operated in a predetermined low engine speed range; and

means responsive to the detected result of said detecting means for selectively applying said actuating signal or said third signal to said operating means so as to select said third signal when the engine speed is within said predetermined low engine speed range and said actuating signal when the engine is not within said predetermined low engine speed range.

4,638,783

CARBURETION SYSTEM FOR ENGINES

Warren E. Snyder, Elm Grove, Wis., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 12, 1985, Ser. No. 722,666
Int. Cl.[4] F02B *43/00*
U.S. Cl. 123—527 16 Claims

1. An improved carburetion system for spark-ignited, gaseous fueled engines having an intake system and an exhaust system, said carburetion system comprising:

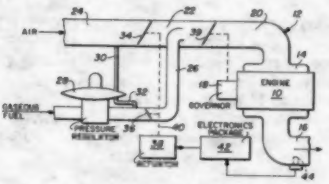
a fuel and air mixer having an outlet for connection to said intake system;

pressure regulated fuel supply means connected to said mixer;

air supply means connected to said mixer;

first valve means in said air supply means for regulating the flow of air to said mixer;

second valve means in said fuel supply means for regulating the flow of fuel to said mixer;



fuel and air control means for positioning said valve means to decrease the fuel supplied to said mixer while increasing the air supplied to said mixer and vice versa; and,

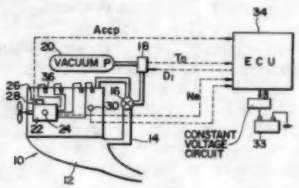
pressure regulating means for controlling the pressure of said fuel being supplied to said mixer.

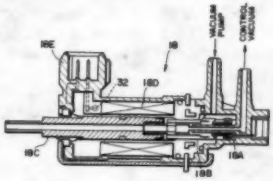
4,638,784

METHOD OF AND APPARATUS FOR CONTROLLING VACUUM MODULATING VALVE FOR EXHAUST GAS RECIRCULATION CONTROL

Shinji Ikeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 12, 1985, Ser. No. 754,161
Claims priority, application Japan, Jul. 16, 1984, 59-147139
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—571 9 Claims





1. An apparatus for controlling a vacuum modulating valve for exhaust gas recirculation control, incorporating therein a temperature detecting element, wherein said method comprises:

means for detecting an engine speed;

means for detecting an engine load;

means for determining a required drive signal of said vacuum modulating valve in accordance with operating conditions of an engine, including the engine speed and the engine load;

means for correcting said required drive signal in accordance with a temperature of said vacuum modulating valve detected by said temperature detecting element, a battery voltage and a driving level of said required drive signal to obtain a corrected drive signal; and means for

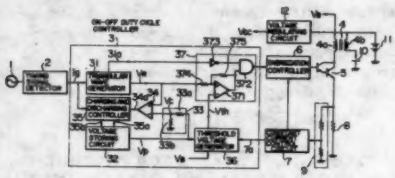
driving said vacuum modulating valve in response to the corrected drive signal.

4,638,785

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Takeshi Matsui, Toyohashi; Shunichi Takeda, Obu, and Tomoatsu Makino, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 7, 1986, Ser. No. 827,167
Claims priority, application Japan, Feb. 11, 1985, 60-24993
Int. Cl.[4] F02P *5/08*
U.S. Cl. 123—644 **12 Claims**



1. An ignition system for an internal combustion engine comprising:

timing signal detecting means responsive to a rotation speed of an engine to generate a pulse signal including a leading edge and a trailing edge corresponding to an ignition timing and having a predetermined duty cycle;

triangular wave generating means for generating a triangular wave voltage synchronized with the trailing edge of said pulse signal;

voltage storing means for storing a voltage level of said triangular wave voltage in synchronism with the leading edge of said pulse signal;

a voltage divider for dividing the stored voltage in said voltage storing means to generate a reference voltage;

comparing means for comparing said reference voltage and said triangular wave voltage to detect a difference therebetween;

charging and discharging control means for correcting the stored voltage in said voltage storing means to reduce said difference at the leading edge of said pulse signal to zero;

threshold voltage generating means for generating a threshold voltage which is offset from said stored voltage by a voltage value corresponding to a desired dwell time of an ignition coil; and

energization control means for controlling a dwell time of said ignition coil in accordance with a result of a comparison between said threshold voltage and said triangular wave voltage.

4,638,786

MAGNETIC UTENSIL-HOLDER

Lloyd P. Lucky, P.O. Box 670803, Chugiak, Ak. 99567

Filed Jan. 30, 1985, Ser. No. 696,292
Int. Cl.[4] F24C *15/30*
U.S. Cl. 126—24 **21 Claims**

1. A magnetic utensil-holder for preventing movement of a cooking utensil placed on a cooking surface, comprising:

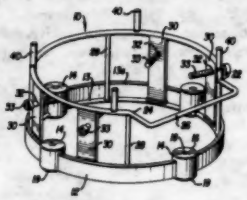
frame means, including:

first ring means having a substantially circular shape;

means for magnetically securing said first ring means to said cooking surface;

second ring means having a substantially circular shape; and,

means for supporting said second ring means a predetermined distance above said first ring means; and,



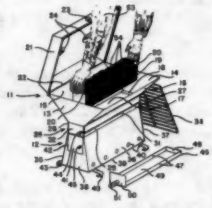
means on said frame means for adjusting said holder to accommodate various utensil sizes.

4,638,787

GRILL MEANS

William H. Tyson, Greenville, N.C., assignor to John G. Mills, Wake Forest, N.C., a part interest

Filed Jun. 17, 1985, Ser. No. 744,955
Int. Cl.[4] A47J *37/00*
U.S. Cl. 126—25 R **6 Claims**



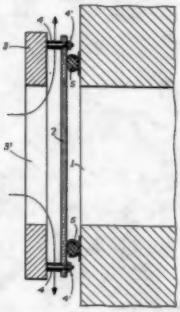
1. An improved charcoal ignition and grilling means comprising: an ignition chamber having a bottom, a surrounding wall structure extending upwardly from said bottom, and an open top wherein said surrounding wall structure slopes inwardly from said bottom to said open top; a grill chamber having a surrounding wall structure, an open bottom and an open top wherein said surrounding wall structure slopes outwardly from said open bottom to said open top; a collar extending between said open top of said ignition chamber and said open bottom of said grill chamber for supporting said grill chamber above said ignition chamber and for providing means for air to flow between said ignition chamber and said grill chamber; basket type means disposed within said grill chamber for receiving and containing charcoal directly above said open bottom; means for supporting said basket type means within said grill chamber; a removable ash pan which can be inserted into said collar so as to substantially close the horizontal cross section of said collar; a generally horizontal grill disposed within said grill chamber above said basket type means; means for supporting said grill within said grill chamber; and a smoke cover movable between an open and closed position for closing said open top of said grill chamber whereby when a readily combustible material is placed within said ignition chamber and ignited, flames will be funneled upwardly through said collar into said grill chamber where said flames will ignite charcoal in said basket type means.

4,638,788

DEVICE FOR MOUNTING A GLASS PANE ON AN OVEN DOOR

Pierre Lancelot, Gommegnies, France, assignor to Eurofours, Gommegnies, France

Filed Dec. 19, 1984, Ser. No. 683,544
Claims priority, application France, Jan. 17, 1983, 84 00684
Int. Cl.[4] F23M 7/00; F24C 15/04
U.S. Cl. 126—198 6 Claims



1. An oven glass door system comprising in combination an oven including an opening for providing access; a gasket means, said gasket means being secured to said oven about said opening and an oven door, said oven door including at least one transparent panel means having a first face and a second opposed face secured to the oven door in spaced relationship thereto so that said first face of said transparent panel is disposed in facing relationship with the oven door and so that said second face of said transparent panel is disposed in cooperative engagement with said gasket means to form a seal therebetween when said door is in a closed position.

4,638,789

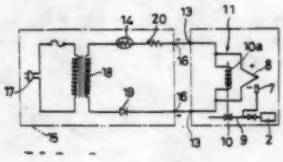
SAFETY APPARATUS FOR COMBUSTION DEVICE

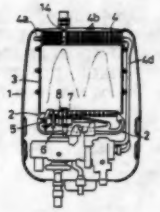
Takashi Ueki, Tokyo, and Yoshihiro Ishikawa, Kagamihara, both of Japan, assignors to Rinnai Kabushiki Kaisha, Nagoya and Tokyo Gas Kabushiki Kaisha, Tokyo, both of, Japan

Filed Feb. 8, 1985, Ser. No. 700,002
Int. Cl.[4] F24H 1/08; F23N 5/24
U.S. Cl. 126—351 13 Claims

1. In a combustion unit having at least one burner therein, a safety valve in a fuel supply passage to the burner, a solenoid means for controlling the valve, and means for providing a reference voltage to the solenoid means, the improvement which comprises a detecting means including a sensor means operatively positioned and arranged with respect to the combustion unit for sensing concentration of CO in space influenced by exhaust gas therefrom, said detecting means also including a power source and a switching means, the sensor means being connected between the power source and the switching means; and wherein in the event of a potentially hazardous situation, the detecting means generates a voltage of opposite polarity to the reference voltage, and wherein at a predetermined difference between the reference voltage and the generated voltage from the detecting means, the solenoid means is actuated to close the valve in the fuel supply passage, thereby turning off the burner.

6. In a gas water heater, the combination of at least one burner, a heat exchanger, a body between the burner and the heat exchanger, a safety valve in a fuel supply passage to the burner, a solenoid means for controlling the valve, means including a thermocouple mounted in the heater in juxtaposition to the burner for providing a reference voltage, a pair of external terminals on the heater, a detecting unit connected to the terminals and generating a voltage of opposite polarity to the reference voltage, the detecting unit including a power source, a switching element and a sensor means connected therebetween, and the sensor means comprising a CO sensor whose resistance changes in accordance with the gas concentration, whereby at a predetermined difference between the reference voltage and the voltage generated by the detecting unit, the solenoid means is actuated to close the valve, thereby turning off the burner.



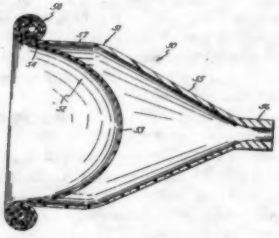


4,638,790

CONTRACEPTIVE HOOD

Anthony J. Conway; Peter R. Conway, both of Chatfield, and Philip J. Conway, Stewartville, all of Minn., assignors to Mentor Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 577,602, Feb. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 475,852, Mar. 16, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,608
Int. Cl.[4] A61B 19/00
U.S. Cl. 128—138 R 15 Claims



1. A contraceptive hood to be adhesively applied to a penis, said contraceptive hood including:

an inner thin flexible cylindrical member having a closed and an open end;

an outer relatively thick cylindrical member, said outer member having an open and a partically closed end;

said cylindrical members being rolled outwardly upon themselves from their open ends to form a single roll with consecutively larger turns;

the outer surface of said outer cylindrical member having an adhesive release layer thereon and said members having a layer of pressure sensitive adhesive therebetween in

contact with the inner surface of the inner member and in contact with the release layer so that upon said cylindrical members being unrolled onto a penis, the adhesive adheres only to the inner surface of said inner cylindrical member to cause the inner cylindrical member to adhere to the penis; and

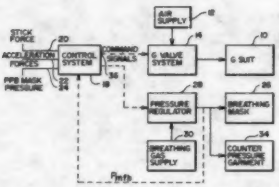
said outer cylindrical member being removable outwardly from said inner member after said members have been unrolled onto a penis.

4,638,791

APPARATUS AND METHODS FOR PROVIDING RAPID PROTECTION FROM ACCELERATIVE FORCES EXPERIENCED BY AIRCRAFT CREW MEMBERS

Steven B. Krogh, King County, and Adam J. P. Lloyd, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 22, 1985, Ser. No. 757,740
Int. Cl.[4] A62B *7/14*
U.S. Cl. 128—1 A **31 Claims**



1. Apparatus for controlling the pressurization of an anti-acceleration garment worn by an occupant of an aircraft, said apparatus comprising:

a. first valve means for regulating the flow of fluid to said anti-acceleration garment to control the pressurization thereof;

b. control means including:

(1) means for (i) determining a level of an anticipated accelerative force which is generally perpendicular to a longitudinal axis of said aircraft in a manner that said level of anticipated accelerative force is determined as a function of a level of control force applied to said aircraft that would create said accelerative force, and (ii) for generating a first output indicative of said anticipated accelerative force level,

(2) means (i) for determining a level of sensed accelerative force which is generally perpendicular to said longitudinal axis of said aircraft, and (ii) for generating a second output indicative of said sensed accelerative force level,

(3) means for compensating for an increase in said sensed accelerative force level by decreasing said first output at a selected rate as said level of sensed accelerative force increases and for generating a third output indicative of said decreased first output,

(4) means for combining said second output with said third output to generate a first command output equal to the sum of said second and third outputs; and

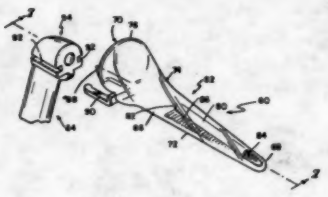
c. first valve control means (i) responsive to saud command output, and (ii) operatively connected to said first valve means, for regulating said first valve means to control the flow of fluid to said anti-acceleration garment as a function of said command output.

4,638,792

ADJUSTABLE SPECULUM WITH INCORPORATED LIGHTING SYSTEM

Kermit H. Burgin, R.R. #1, Box 334, Whitestown, Ind. 46075

Continuation of Ser. No. 394,291, Jul. 1, 1982, Pat. No. 4,502,468, which is a continuation-in-part of Ser. No. 105,509, Dec. 20, 1979, Pat. No. 4,344,419, and a continuation-in-part of Ser. No. 354,812, Mar. 4, 1982, and a continuation-in-part of Ser. No. 284,484, Jul. 17, 1981, abandoned. This application Mar. 4, 1985, Ser. No. 708,159
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **4 Claims**



1. An examination instrument, comprising

a base unit having a somewhat pistol-grip shaped handle portion, and a head portion formed with said handle portion, said head portion comprising a first front surface and two side surfaces adjacent said front surface;

a light source mounted in said head portion for providing light in said head portion of said base unit;

a light-transmissive examination member for contacting a body surface to be examined;

a means for removably attaching and securing said examination member to said head portion of said base unit such that said examination member is attached adjacent said light source, said attachment means including a groove extending at least partially across each of said two side surfaces, said grooves positioned on opposite sides of said head portion of said base unit and opening away from each other, said examination member including a proximal end portion configured with rearwardly projecting fingers spaced apart from each other along a rearward surface of said examination member a distance equal to the spacing of said grooves, said grooves receiving said fingers in sliding frictional engagement for sliding insertion of said examination member into, and sliding removal from said grooves.

4,638,793

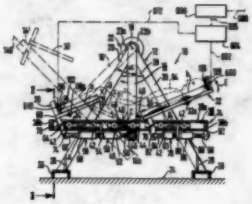
COUCH OF ADJUSTABLE INCLINATION FOR BODY EXTENSION

Jens Therkorn, Volpinistrassee 2, 8000 Munich 19, Fed. Rep. of Germany

PCT No. PCT/EP84/00186, § 371 Date Feb. 26, 1985, § 102(e) Date Feb. 26, 1985, PCT Pub. No. WO85/00104, PCT Pub. Date Jan. 17, 1985
PCT Filed Jun. 22, 1984, Ser. No. 709,025
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323310
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—71 **27 Claims**

1. Couch of adjustable inclination, especially for body extension of a person lying on the couch in a head-down position, comprising a couch carrier means, a support table securable on the carrier means in different inclinations, a foot retaining device mounted at one end of the table and a head rest mounted at the other end of the table, a back rest articulated to the table and supporting said head rest, a calf support mounted on the support table for supporting the legs with knees bent, the calf support adjustable continuously or in fine stages for the

variation of the bending angle of the knee defined between lower leg and thigh, wherein a total body support length is defined by the length of the calf support, the length of the back rest and the distance between adjacent ends of the calf support and the back rest, the body support length being adjustable continuously or in fine stages in accordance with the increas-



ing body extension with the table occupied and inclined in a head-down position, and wherein the foot retaining device is mounted on the support table so that the distance between the foot retaining device and the head rest does not decrease when the calf support is adjusted for changing the bending angle of the knee.

4,638,794

JOINT CUFF

Gunter Grisar, Am Suedhang 3B, D-6301 Wettenberg 3, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,512

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 8405572[U]; Sep. 29, 1984, 3435955

Int. Cl.[4] A61F *5/37, 5/14*

U.S. Cl. 128—80 H **8 Claims**

1. A joint cuff, in particular for the support and joint guiding of an ankle joint of a user, comprising: an elongated member having two longitudinally extending side portions interconnected by a bottom portion, said two side portions having a lateral width to enable only laterally facing portions of the ankle joint to be covered thereby, both lateral edges of said bottom portion defining an angle opening in the same direction, the entirety of said bottom portion extending to one lateral side of said central longitudinal axis of said side portions, wherein said joint cuff includes a thermoplastic material which is deformable upon application of heat thereto to enable said thermoplastic material to be conformed to the ankle joint, said thermoplastic material having a stiff characteristic at ambient temperature, and said lateral width dimension of said two side portions of said joint cuff being such that the forwardly and rearwardly facing sides of the tibia remain free from coverage by said joint cuff, while said joint cuff is substantially juxtaposed against and covers the laterally facing sides thereof, so that, in use after said side portions and said bottom portion have been respectively form fitted and fitted against the laterally facing sides of the user's ankle and the bottom of the user's foot, respectively, said side portions are held against the laterally facing sides of the ankle joint by a bandage member, the user's foot having mobility to enable the toe portion of the foot to move freely up and down but the ankle joint being reinforced in the lateral directions of movement of the foot due to said stiff characteristic of said thermoplastic material at ambient temperature.

4,638,795

MATERIAL FOR SUPPORT DRESSINGS

Roland Richter, Cologne; Hanns P. Müller, Odenthal, and Christian Wegner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 757,093

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426732

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—90 **10 Claims**

1. In a material which hardens on access of moisture, for the production of support dressing in human or veterinary medicine comprising a flexible carrier material impregnated and/or coated with an agent containing isocyanate groups, the improvement wherein the agent containing isocyanate groups includes an addition product of a sulphonyl isocyanate with at least one of a tertiary amine and a compound with a tin(II) or tin(IV) carboxylate structure.

4,638,796

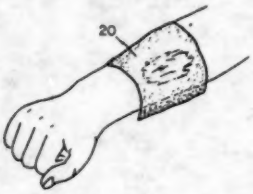
METHOD OF DRESSING WOUNDS

Calvin L. Sims, Richardson, Tex., assignor to Winfield Laboratories, Inc., Richardson, Tex.

Continuation of Ser. No. 352,117, Feb. 25, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 621,074

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—155 **26 Claims**



1. A method of dressing an open wound, burn or skin graft, comprising:

placing an adhesive-free surfacing barrier without a backing layer and, without any barrier supporting base layer pieces, in direct contact with the wound, burn or graft, said barrier being in direct contact with the surfaces of the body adjacent the wound, burn or graft, said barrier being comformable to the contours of the wound, burn or graft site and the adjacent body surfaces, said barrier consisting of a nonwoven, netted material integrally formed in a synthetic polymeric material and possessing straight smooth parallel longitudinal ribs interconnected by a plurality of fibrillated and split strands exhibiting a plurality of small fibres non-uniformly interspersed with a plurality of differently sized voids and said synthetic polymeric material consisting of a blend of at least two incompatible polymers extruded in sheet form, the blend comprising a mixture of a major proportion by weight of a polyolefin and a minor proportion by weight of a polymer containing an aryl group, said barrier being permeable and nonabsorbent to blood and serum and said barrier being substantially nonadherent to the wound, burn or graft site or adjacent body surfaces; and

placing an absorbent covering dressing over the surfacing

barrier, said covering dressing being of a predetermined thickness to adsorb fluid from the wound, burn or graft whereby traumatic disruption of the graft, burn or wound is minimized upon removable of said covering dressing for visual examinations of the graft, burn or wound or changes of said cover dressing.

4,638,797

REINFORCED MOISTURE VAPOR PERMEABLE, PRESSURE-SENSITIVE ADHESIVE WOUND DRESSINGS

Richard E. Merrill, Sanbornton, N.H., and Craig L. Allard, Wakefield, Mass., assignors to Acme United Corporation, Fairfield, Conn.

Filed Apr. 23, 1986, Ser. No. 855,586
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 15 Claims

1. A homogeneous, reinforced, moisture vapor permeable, pressure-sensitive adhesive wound dressing comprising

A. a reinforced membrane film or layer incorporating a homogeneous blend of

a. at least one thermoplastic polyurethane resin,

b. a non-urethane copolymer resin, and

c. silica; and

B. a moisture vapor permeable, pressure sensitive adhesive applied to one surface of said membrane film or base,

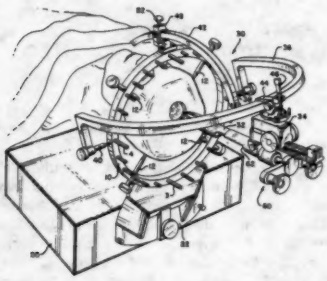
whereby a reinforced, moisture vapor permeable, pressure sensitive adhesive wound dressing is achieved which possesses a substantially increased modulus of elasticity, imparting greater stiffness and rigidity to the wound dressing for increased handling ease.

4,638,798

STEREOTACTIC METHOD AND APPARATUS FOR LOCATING AND TREATING OR REMOVING LESIONS

C. Hunter Shelden, 1345 Bedford Rd., San Marino, Calif. 91108, and Gilbert D. McCann, 2247 No Villa Hts. Rd., Pasadena, Calif. 91107

Filed Sep. 10, 1980, Ser. No. 185,937
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 B 9 Claims



1. In a stereotactic system for treating a region of a patient's body, a method for using a tomography scanner for defining a selected point of the region in a three-dimensional coordinate system with reference to a predetermined point of means attached to the patient for establishing a reference point of said coordinate system for accurate control of instruments used to treat said region, comprising the steps of

placing said means on the patient for precise correlation between the location of the region to be treated and the control system for treatment of the region in said three-dimensional coordinate system,

conducting a series of parallel tomography scans through said region to be treated and at least part of said means for determination of three-dimensional coordinates of points in said region of the body of said patient to be treated relative to said reference point of said means,

determining from data of said scan series three-dimensional coordinates with respect to said reference point of said means of at least one point of said region,

determining all parameters of the system for control of instruments used for treatment with respect to said reference means, and

completing the treatment with instruments guided by said control system with reference to said means still attached to said patient,

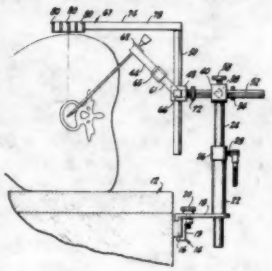
wherein said reference means is a ring attached to the patient, and said reference point is the center thereof.

4,638,799

NEEDLE GUIDE APPARATUS FOR DISCOLYSIS PROCEDURES

Robert R. Moore, 4010 East Ave., Hayward, Calif. 94545

Filed Jun. 13, 1985, Ser. No. 744,392
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 B 12 Claims



1. A needle guide apparatus for directing an injection needle into a spinal disc of a patient on a conventional operating table having a side rail with the patient having a sagittal this longitudinally oriented to the table comprising:

(a) mounting means for connecting the apparatus to the table in a posterior location to a patient lying in a lateral decubital position on the table;

(b) needle guide means for guiding the injection needle on a select penetration angle into the lateral posterior of the patient;

(c) adjustable support structure supporting said needle guide means and interconnecting said guide means with said mounting means said support structure having adjustable means for locating said needle guide means at a predetermined location for accurate guide of a needle into a select spinal disc wherein said adjustable support structure comprises at least one vertical member with adjustment means for adjusting the height of the needle guide means, at least one horizontal member disposed parallel to the sagittal axis of the patient, said horizontal member cooperating with connected adjustment means for adjusting the fore and aft position of said needle guide means parallel to the sagittal axis of the patient, and at least one transverse member disposed transverse of the sagittal axis of the patient said transverse member cooperating with connected adjustment means for adjusting the cross position of said needle guide means transvrse to the sagittal axis of the patient;

(d) indicator means connected to said support structure for indicating the relative position of said guide means relative to the select disc.

4,638,800

LASER BEAM SURGICAL SYSTEM

Thomas J. Michel, Miami, Fla., assignor to Research Physics, Inc, Hollywood, Fla.

Filed Feb. 8, 1985, Ser. No. 699,933
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **13 Claims**

1. A steerable laser beam system for performing surgery at a target in a surgical site within a body cavity, said system comprising:

A. a cannula insertable into a body passage leading to the surgical site, said cannula including a rotatable inner tube provided with an inlet section having an input port and an outlet section provided with a lateral output port which, by rotation of the inner tube, can be made to assume a position adjacent the target;

B. a laser source coupled to said input port to produce a collimated laser beam which is directed toward said outlet section;

C. a normally planar deformable membrane having a reflective surface supported in said outlet section at an angle with respect to the inner tube axis to project the laser beam impinging thereon through said output port toward the target in the surgical site; and

D. a controllable actuator coupled to the rear of the membrane at its geometric center to force said membrane to assume a concave form having a quasi-parabolic shape which optically brings said beam to a focus at the surgical site target, so that by rotating the inner tube and by focusing the beam projected from said output port one can steer the beam to precisely strike the target; said membrane having an elliptical form and being peripherally joined by an elastomeric coupler to a rigid supporting ring so that the membrane, when it is deformed to assume a quasi-parabolic shape, is not distorted at its periphery.

4,638,801

LASER OPHTHALMIC SURGICAL SYSTEM

Richard T. Daly, Huntington, and Stephen L. Trokel, New York, both of N.Y., assignors to Lasers for Medicine, Hauppauge, N.Y.

Continuation of Ser. No. 511,191, Jul. 6, 1983, abandoned. This application Oct. 23, 1985, Ser. No. 790,637
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **10 Claims**

1. An apparatus for performing microsurgery on a tissue of an eye comprising:

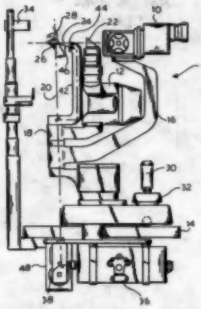
a frame;

first and second arms rotatably mounted on said frame;

means mounted on said first arm for projecting a slit image along a first optical axis on said tissue for illuminating said tissue, said slit image comprising a first and a second segment separated by a dark area with a horizontal center line, said dark area being provided as a fiducial reference within the eye;

means mounted on said second arm for observing said slit image within the eye along a second optical axis, said first and second axis defining a horizontal plane;

a source for a laser beam having a focal point; and



focusing means mounted on said first arm for focusing said laser beam into the eye by shifting said focal point along a third axis with respect to said slit image, said third axis being at an acute angle with respect to said horizontal plane;

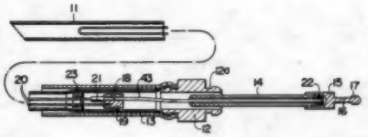
whereby the actual position of said focal point with respect to said slit image is indicated by the relative position of said focused laser image with respect to said fiducial reference as observed along said second optical axis.

4,638,802

HIGH FREQUENCY INSTRUMENT FOR INCISION AND EXCISION

Tsutomu Okada, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Sep. 6, 1985, Ser. No. 773,053
Claims priority, application Japan, Sep. 21, 1984, 59-198053
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.14 **11 Claims**



1. An instrument for use with a source of high frequency power for incision and excision of affected tissue, said instrument comprising:

a sheath formed by a pipe of flexible, electrically insulating material and having a substantial length;

a wire electrode disposed within said sheath so as to be freely movable therein between a first position wherein said wire electrode is wholly within said sheath and a second position wherein said wire electrode extends outside said sheath and forms a loop which can be passed over an affected part;

an operating pipe means disposed for movement into and out of said sheath through an opening formed in said sheath at a proximate end of the sheath and for causing an advancing and retracting movement of said wire electrode; and

an operating unit including a slider connected to said operat-

ing pipe which permits an operator to cause advancing and retracting movement of said pipe, said operating pipe being rotatable relative to said wire electrode.

4,638,803

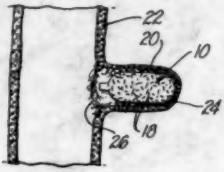
MEDICAL APPARATUS FOR INDUCING SCAR TISSUE FORMATION IN A BODY

Robert W. Rand, 521 N. Bristol St., Los Angeles, Calif. 90049

Continuation of Ser. No. 429,088, Sep. 30, 1982, abandoned. This application Nov. 30, 1984, Ser. No. 677,601

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—325 **14 Claims**



8. A medical balloon which comprises:

an inflatable balloon formed from an elastomeric material;

a composition present on at least the outside surface of said balloon, said composition chosen from the group consisting of iron, copper, tantalum, gold, silver, platinum, chromium and their derivatives whereby said composition is capable of inducing the formation of thrombosis followed by invasion of capillaries and fibroblasts and subsequent scar tissue formation.

4,638,804

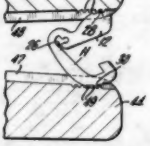
DOUBLE-LATCHED NON-METALLIC, BIO-COMPATIBLE HEMOSTATIC CLIP

Stephen J. Jewusiak, Denville, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 277,582, Jun. 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 123,878, Feb. 25, 1980, abandoned. This application Jun. 14, 1985, Ser. No. 744,832

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—325 **6 Claims**



1. A non-metallic, bio-compatible polymeric hemostatic clip capable of being applied to a blood vessel to close said vessel using a clip applying instrument, said clip comprising first and second leg members, each leg member having an outer surface and an inner vessel clamping surface, in opposition to a vessel clamping surface of the leg member;

said first leg member terminating at each end in a return bend forming a hook member extending outward from said vessel clamping surface;

said second leg member terminating at each end in a configuration adapted for engagement by said hook members of said first leg member;

integral resilient hinge means joining said first and second leg members proximal to one end of said leg members;

a shearable web extending from the vessel clamping surface of the first leg member to the proximal end of the second leg member when said clip is in the open position, said web being sheared during closure of the clip;

applier gripping means disposed on the outer surface of said first and second leg members;

said first and second leg members being pivotable about said resilient hinge means from an open position to a closed position with the ends of said second leg member being engaged by the corresponding hook members of the first leg members as said leg members are pivoted to a closed position whereby said clip is maintained the resilient hinge means deteriorates.

4,638,805

SELF-VENTING BALLOON DILATATION CATHETER AND METHOD

Philip E. Powell, Mountain View, Calif., assignor to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Jul. 30, 1985, Ser. No. 760,637

Int. Cl.[4] A61M *29/02*

U.S. Cl. 128—344 **10 Claims**

1. In a self-venting balloon dilatation catheter, a flexible tubular member having first and second lumens extending therethrough, an inflatable balloon carried by the distal extremity of the tubular member in such a manner so that the first lumen extends through the balloon and is out of communication with that interior of the balloon and the second lumen is in communication with the distal extremity interior of the balloon and means disposed between the balloon and the tubular member for venting air from the interior of the balloon but inhibiting the escape of liquid from the balloon.

4,638,806

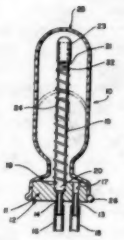
RECTAL HEMORRHOID THERAPEUTIC APPARATUS

Lawrence D. Bartlett, Hartford, Ky., assignor to Robert T. Johnson, Hartford, Ky., a part interest

Filed Jul. 9, 1985, Ser. No. 753,193

Int. Cl.[4] A61F *7/12*

U.S. Cl. 128—400 **3 Claims**



1. A topical hemorrhoid therapy apparatus, comprising in combination,

an inserter having a base, a central aperture in said base, a second aperture in said base radially spaced from said central aperture in said base, a tubular rod means with one end disposed in said central aperture in said base, a cap secured over an extremity of said tubular rod means remote from said base, a third aperture in said tubular rod means which allows fluid to flow through said rod means,

a flexible cover secured over said rod and secured to an outer circumference of said base by an elastic means for snug engagement with said base, first and second hose nipples extending from a bottom portion of said base and connected with said central aperture and said second aperture, respectively, said central aperture and said first nipple connected thereto serving as a unitary outlet means for fluid flowing from within said flexible cover, said second aperture and said second nipple serving as a unitary inlet means for fluid flow into said inserter, inlet and outlet tubing members connected to said nipples, and means surrounding said tubular rod means to prevent said cover from obstructing fluid entry into said third aperture whereby said inserter may provide topical therapeutic benefit to a bodily orifice such as the rectum.

4,638,807

HEADBAND ELECTRODE SYSTEM

Francis E. Ryder, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.

Filed Aug. 27, 1985, Ser. No. 770,150
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—644 **16 Claims**

1. A headband electrode system comprising: an elongate flexible band; a center electrode mounted upon said band at a central portion of said band at a first elevation relative to said band; a pair of temporal electrodes; a pair of arm members each carrying one of said temporal electrodes, said arm members extending from said band to dispose the temporal electrodes at a second elevation relative to the band such that said temporal electrodes are below said center electrode, and pivotal mounting means connecting the arm members to the band, such that said arm members are pivotally mounted to the band, one to either side of the center electrode for mounting each of said temporal electrodes for pivotal movement relative to said band; said arm members being pivotally movable for positioning said temporal electrodes at a plurality of positions relative to said center electrode; and means for affixing said band to the head of a subject so as to position said center electrode substantially centrally upon the forehead of the subject and said temporal electrodes for pivotal movement beneath and to either side of said center electrode, said band comprising a relatively flat member of predetermined thickness over a major portion thereof and having two cross-sectional regions of decreased thickness which extends transversely and continuously across said band, one said continuous region of decreased thickness being disposed on either side of said center electrode to increase the flexibility of the band and facilitate the ability of the band to conform to the contour of the head of a wearer.

4,638,808

CIRCUIT FOR SEPARATING ONE TYPE SIGNAL COMPONENT FROM ANOTHER

Daniel D. Mawhinney, Livingston, N.J., assignor to RCA Corporation, Princeton, N.J.

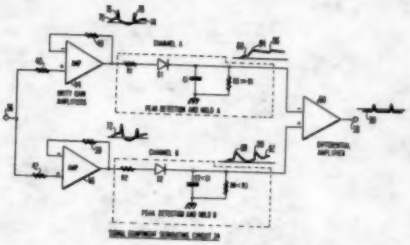
Filed Aug. 16, 1984, Ser. No. 641,464
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—653 **11 Claims**

6. A heart rate monitor comprising a continuous wave microwave transceiver having a transmitting/receiving antenna capable of being directed toward the heart of a patient and, when so directed, for producing a signal having a periodically pulsing component, the period corresponding to the period of successive heart beats and having a reciprocating component corresponding to breathing of said patient, said heart rate monitor further comprising in combination:

a comparator; and

first and second channels coupled to receive said pulsing and reciprocating signal,

said first and second channels being coupled to respective inputs of said comparator, each channel comprising a peak detection and holding circuit (PDH) receptive of said pulsing and reciprocating signal and coupled at its output



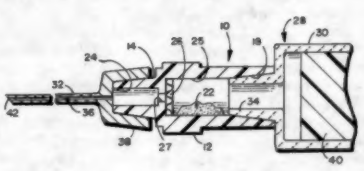
to the comparator, each PDH comprising a charging and discharging circuit, the second channel charging and discharging circuit having a faster charging and discharging time than the first channel charging and discharging circuit, the second channel PDH attenuating the input signal more than the first channel PDH, said comparator being receptive of the two peak detected and held signals for producing a signal having a component corresponding to the time when the pulsing component of the input signal representing heart beat is present.

4,638,809

METHOD OF PREPARING RADIONUCLIDE DOSES

John H. Kuperus, 10430 Mohawk, Cypress, Calif. 90630

Filed Mar. 22, 1984, Ser. No. 592,091
Int. Cl.[4] A61B 5/14
U.S. Cl. 128—653 **7 Claims**



1. A method of preparing aliquot dosea of a tracer material useful in diagnostic nuclear medicine comprising:

storing descrete quantities of a lyophilized radionuclide carrier in separate tubular containers from which air and moisture is excluded,

selecting from said tubular containers a container in which is stored a carrier appropriate for a nuclear diagnostic test to be performed,

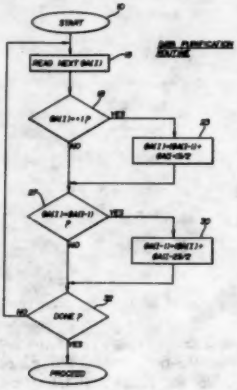
interposing said selected container between the needle and the barrel of a hypodermic syringe, and drawing a predetermined amount of a liquid containing a radionuclide tracer in known concentration into said hypodermic syringe barrel through said hypodermic needle and through said selected container to disolve the discrete quantity of lyophilized carrier therein to combine said carrier with said redionuclide tracer to form an aliquot dose of nuclear diagnostic tracer material, as needed.

4,638,810

AUTOMATED DIASTOLIC BLOOD PRESSURE MONITOR WITH DATA ENHANCEMENT

Maynard Ramsey, III, Tampa; Richard Medero, Lutz, and Rush W. Hood, Jr., Tampa, all of Fla., assignors to Critikon, Inc., Tampa, Fla.

Filed Jul. 5, 1985, Ser. No. 751,825
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—681 **9 Claims**



2. In combination in digital processor controlled automated blood pressure measuring apparatus operative in conjunction with a stored program; (a) an inflatable cuff; (b) means for inflating and deflating said cuff; (c) pressure transducer means coupled to said cuff for signalling the pressure obtaining in said cuff; (d) means responsive to the pressure signalled by said transducer for generating a signal representing blood pressure complexes sensed by said cuff and said transducer coupled thereto; (e) complex peak storing means for storing values characterizing the peak amplitudes of said signals representing complexes at different cuff pressures; (f) cuff pressure storing means for storing the cuff pressures obtaining when said pulse peak signals arose; (d) data purifying means operative upon values stored by said complex peak amplitude characterizing means pressure complex peak storing means for correcting data inaccuracies; and (h) diastolic pressure determining means, said diastolic pressure determining means comprising (i) means for locating the maximum peak amplitude stored in said complex peak storing means, (ii) computing means for computing two different levels during a given measurement cycle, each a different fraction of said peak amplitude value, (iii) means responsive to the values determined by said computing means for selecting from said complex peak storing means plural peak amplitudes generated at cuff pressures lower than that obtaining when said maximum cuff pressure pulse peak signal arose, and (iv) determining means for determining diastolic pressure from said selected plural amplitudes and the cuff pressures stored in said cuff pressure storing means corresponding to said selected plural signals.

4,638,811

VASCULAR INTERFACE

Jose Bisera, Camarillo; James H. Carrington, Los Angeles, and Max H. Weil, Beverly Hills, all of Calif., assignors to Institute of Critical Care Medicine, Los Angeles, Calif.

Continuation of Ser. No. 830,847, Sep. 6, 1977, Pat. No. 4,258,717. This application Dec. 15, 1980, Ser. No. 216,189
Int. Cl.[4] A61B 5/00; A61M 35/00, 5/00
U.S. Cl. 128—673 **5 Claims**

1. A vascular interface apparatus, for connection to a patient comprising:

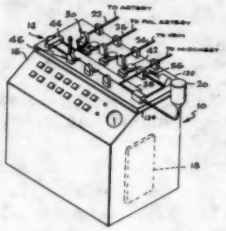
an arterial station including an arterial station valve with first, second, and third ports and an arterial catheter coupled to said first port for connection to an artery of the patient;

a venous station including a venous catheter for connection to a vein of the patient;

a sample station which includes a sample valve having first, second, and third ports and a valve member movable to connect said first port to said second or third ports, and a syringe receiver means at said third port for receiving a syringe means that can hold a blood sample;

a first conduit coupling said second port of said arterial station valve to said first port of said sample valve;

a second conduit coupling said second port of said sample valve to said venous station;



means for operating said sample valve to interconnect said first and second sample valve ports to cause blood flow from an artery to a vein past said sample station, and to interconnect said first and third sample valve ports to enable the filling of a syringe means with a blood sample;

a flushing source which includes a container of flushing solution coupled to said third port of said arterial station valve; and

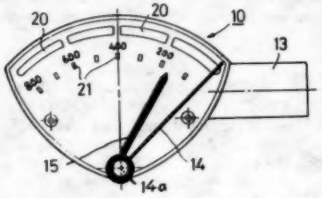
flushing means for operating said arterial station valve to connect said third port to said first port to flush said arterial catheter by passing flushing solution through it, and also to pass flushing solution through the first and second conduits and through the venous catheter to the patient.

4,638,812

EXHALATION FLOW METER

Taisto Häkkinen, Hämeenlinna, Finland, assignor to Etelä Hameen Keuhkovammyhdistys R.Y., Finland

PCT No. PCT/FI83/00001, § 371 Date Jul. 19, 1984, § 102(e) Date Jul. 19, 1984, PCT Pub. No. WO84/02642, PCT Pub. Date Jul. 19, 1984
PCT Filed Jan. 4, 1984, Ser. No. 637,211
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—726 **8 Claims**



1. A device for measuring peak flow of exhalation of an individual, said device comprising,

a housing having an interior,

an axle affixed to said housing in the interior thereof,

a flap disposed within said housing interior and having a

substantially tubular portion rotatably mounted on said axle,

a spring mounted within said tubular portion, said spring having a first end connected to said tubular portion and a second end connected to said housing,

a pointer rotatably mounted in said housing situated in a position to be contacted by said flap, and

mouthpiece means provided on said housing for directing a flow of fluid into said housing interior, said flap and said pointer being situated in said housing with said flap being positioned between said pointer and said mouthpiece means,

whereby upon initiating a flow of fluid through said mouthpiece means and into said housing interior, said flap rotates about said axle from an initial position and contacts and rotates said pointer to a position indicative of peak flow, and

upon termination of said fluid flow, said spring returns said flap to the initial position, while said pointer remains at the position indicative of peak flow.

4,638,813

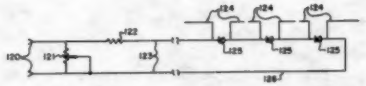
ELECTRIC FIELD PROBE

Paul F. Turner, North Salt Lake City, Utah, assignor to BSD Medical Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 405,947, Aug. 6, 1982, which is a continuation-in-part of Ser. No. 136,506, Apr. 2, 1980, Pat. No. 4,462,412. This application Mar. 15, 1984, Ser. No. 590,030

Int. Cl.[4] A61N *5/00*

U.S. Cl. 128—804 **12 Claims**



1. A system for heating a target with electromagnetic radiation, comprising:

a central control unit;

a source coupled to said control unit, said source generating electromagnetic energy at a frequency and power in response to said control unit;

means coupled to said source for transferring energy from said source to said target; and

input means coupled to said control unit for indicating the status of the target, wherein operation of the system is controlled by said control unit as a function of the target status, said input means including a plurality of electric field probe arrays, each electric field probe array including a plurality of dipole probes aligned along a common axis, each including a diode connected between two linear conductors and said diodes of each probe array collectively connected in series.

11. An electric field probe array comprising:

a plurality of dipole probes aligned along a common axis, each including a diode and two linear conductors, said diode connected between the two linear conductors, said diodes of each probe of the array collectively connected in a series with two resistive leads connected to opposing ends of said series connection, said resistive leads having a resistance per unit length of a value greater than that of one of the dipole conductors.

4,638,814

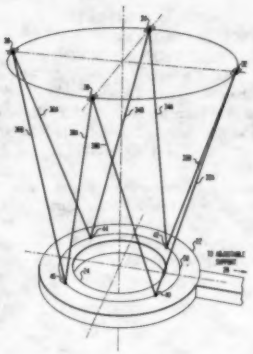
ELECTRON ACCELERATOR UNIT FOR ELECTRON BEAM THERAPY

Keith A. Spanswick, Oceanport, N.J., assignor to Siemens Medical Laboratories, Walnut Creek, Calif.

Filed Sep. 11, 1984, Ser. No. 649,392

Int. Cl.[4] A61N *5/00*

U.S. Cl. 128—804 **14 Claims**



1. An electron accelerator unit for electron beam therapy, comprising:

a source of an electron beam;

means for finally directing at least a portion of said beam to a therapy site, said directing means being mechanically independant of, and electrically isolated from, said source, and having a target area; and

means for aligning said source with said directing means, said aligning means comprising means for projecting at least one beam of light from the source toward said target area.

4,638,815

WATER PIPE

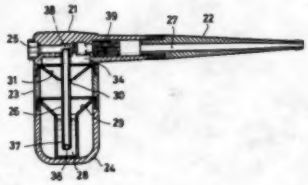
Takeo Yoshioka, 8-16, Saibigashimachi 1-chome, Okayama, Japan

Filed Dec. 16, 1985, Ser. No. 809,414

Claims priority, application Japan, Jun. 26, 1985, 60-98444

Int. Cl.[4] A24F *1/30*

U.S. Cl. 131—173 **1 Claim**



1. A water pipe comprising:

a bowl having a chamber and formed with a hole communicating with said chamber to receive a cigarette;

a stem mounted on said bowl so as to extend laterally therefrom and formed with a smoke passage extending therethrough communicating with said chamber;

a tubular member mounted on said bowl at bottom thereof and having a funnel-shaped wall formed with a hole in the center thereof;

a cap removably mounted on said tubular member at bottom thereof and having a funnel-shaped surface formed with a water reservoir in the center thereof to contain water;

a smoke tube extending vertically through the hole in said funnel-shaped wall into said water reservoir so as to communicate said hole for a cigarette with said water reservoir, said smoke tube having a small hole at a point slightly above its bottom; and

a ball mounted in said smoke tube so as to be movable up and down therein, said smoke tube being adapted to hold said ball therein.

4,638,816

SMOKING COMPOSITIONS CONTAINING A GLYCOSYLAMINE FLAVORANT ADDITIVE

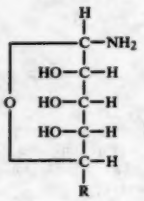
Richard H. Cox, Midlothian; Harvey J. Grubbs, Mechanicsville, and Stephen A. Haut, Chesterfield, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 22, 1985, Ser. No. 714,774

Int. Cl.[4] A24B *3/12*

U.S. Cl. 131—276 **15 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes, and (2) between about 0.001 and 5 weight percent, based on the total weight of filler, of a glycosylamine flavorant-release additive corresponding to the formula:



where R is a hydrogen, methyl or methylol substituent.

4,638,817

DEVICE FOR CONTROLLING CONTENTS OF TOBACCO ON CIGARETTE MACHINE

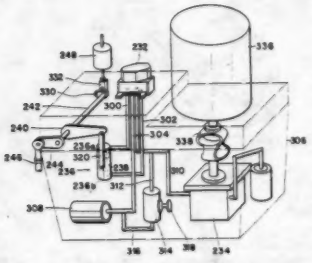
Yutaka Okumoto, Musashino, Japan, assignor to Japan Tobacco, Inc., Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,314

Claims priority, application Japan, May 8, 1984, 59-090257

Int. Cl.[4] A24C *5/14*

U.S. Cl. 131—280 **3 Claims**



1. A tobacco content control device for a cigarette making machine wherein tobacco is transferred along a predetermined path in said cigarette making machine, said tobacco content control device comprising:

a radiometricdensity detector including first and second density detectors provided along said predetermined path to obtain two electric signals representative of tobacco density;

control means connected to said first and second density detectors for maintaining a flow rate of the tobacco at a predetermined level in accordance with said electric signals;

subtractor means connected to said first and second density detectors for obtaining a difference between said two electric signals;

voltage generating means provided independently of said control means and said subtractor means for producing two voltage signals set at two predetermined range;

comparison means connected to said subtractor means and said voltage generating means for comparing said difference between the two electric signals with said two voltage signals to produce an output signal when said predetermined range is outrun;

alarm means connected to said comparison means for informing of an abnormality of said radiometric density detector upon receipt of said output signal of said comparison means.

4,638,818

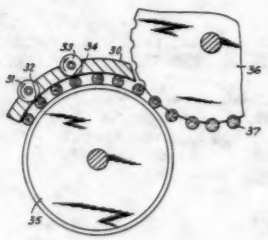
METHOD OF MAKING A FILTER CIGARETTE

Walter A. Nichols, and Reginald W. Newsome, both of Richmond, Va., assignors to Philp Morris Incorporated, New York, N.Y.

Division of Ser. No. 582,600, Feb. 22, 1984, Pat. No. 4,570,649, which is a continuation-in-part of Ser. No. 429,354, Sep. 30, 1982, abandoned. This application Dec. 3, 1985, Ser. No. 804,042

Int. Cl.[4] A24C *1/38*

U.S. Cl. 131—281 **2 Claims**



1. A method of making a filter cigarette comprising a substantially cylindrical tobacco rod, a substantially cylindrical filter plug, plug wrap circumscribing the filter plug, and tipping paper circumscribing the plug wrap and a portion of the tobacco rod, at least one of said plug wrap and said tipping paper being substantially air-impermeable, wherein the tobacco rod and the wrapped filter plug have substantially the same cross-sectional area and shape, the filter plug has a rod end and a mouth end open to permit passage of air and smoke, the tobacco rod and the wrapped filter plug are axially aligned in abutting, end-to-end relation, the plug wrap comprises, in sequence, abutting mouth-end, central, and rod-end bands, the rod-end band has a first opening therein, the rod-end band and the mouth-end band are fixed to the filter plug, the central band is rotatable about the longitudinal axis of the filter plug, the tipping paper comprises a first band and an abutting second band, the first band extends from the mouth end of the filter plug to a position overlying the rod-end band and is attached only to the central band for rotation therewith, the first band has a second opening therein positioned such that rotation of the first band rotates the second opening into varying degrees of registry with the first opening, and the second band extends from the first band to a position on the tobacco rod and joins the tobacco rod to the wrapped filter plug; said method comprising:

making two parallel, circumferentially extending rows of closely spacely perforations in the plug wrap to define the mouth-end, the central, and the rod-end bands, one of said rows spaced from said mouth end and defining said mouth-end and central bands, the second of said rows

spaced from the first of said rows and defining said central and rod-end bands, axially aligning the tobacco rod and the wrapped filter plug in abutting end-to-end relation, making a row of perforations in the tipping paper to define the first and the second bands, applying an adhesive on one side of the tipping paper at a first position overlying the tobacco rod and the portion of the rod-end band to be circumscribed by the second band, and at a second position corresponding to the location of the central band, wrapping the adhesive-coated side of the tipping paper around the axially aligned tobacco rod and filter plug, and forming an opening in the first band and the underlying rod-end band.

4,638,819

DEVICE FOR DECREASING SIDE STREAM SMOKE OF TOBACCO PRODUCTS

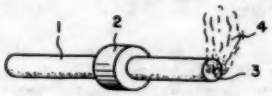
Sakio Ikeda, Nagareyama, Japan, assignor to Dynic Corporation, Kyoto and Mine Kinzoku Kogyo Kabushiki Kaisha, Yokohama, both of, Japan

Filed Mar. 29, 1985, Ser. No. 717,704

Claims priority, application Japan, Mar. 30, 1984, 59-61040; Apr. 17, 1984, 59-75729; Jul. 4, 1984, 59-137223

Int. Cl.[4] A24F *1/02*

U.S. Cl. 131—331 **5 Claims**



1. A device for decreasing generation of side stream smoke from a burning, generally cylindrical tobacco product, comprising:

a main body made of material which is non-combustible in the presence of heat generated by burning tobacco, said main body being formed with a longitudinal through hole for slidably accommodating the outer periphery of said tobacco product;

wherein said through hole has a cross-sectional area in the range of about $\pi r^2 mm^2$ to $\pi(r+2)^2 mm^2$, where r equals the radius of the tobacco product in millimeters;

said main body has a plurality of openings spaced from one another in the longitudinal direction and extending between the outer periphery of said main body and the inner surface of said through hole; and

the ratio between the total area of said openings and the total inner surface of said through hole is selected in the range of about 5 to 15%.

4,638,820

PUFF CONTROL CIGARETTE

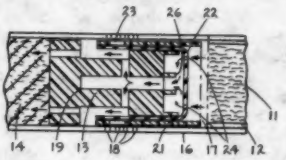
Donald L. Roberts; Anthony L. Angel; Douglas C. Clark, all of Winston-Salem, N.C.; Jack F. Clearman, Blakely, Ga., and T. Stephen Sink, Lexington, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 3, 1986, Ser. No. 825,563

Int. Cl.[4] A24D *3/04*

U.S. Cl. 131—336 **6 Claims**

2. A smoking article comprising in combination a smoke producing material, air ventilation means for providing air to the smoking article and valve means operatively associated with said air ventilation means and adapted to move from a first position to a second position during each puff to deliver to a smoker a stream containing a first concentration of smoke from the smoke producing material during the first portion of the puff and a second lower concentration of smoke and substantially increased concentration of air from the air ventilation



means during the remainder of the puff and then return to the first position at the end of the puff.

4,638,821

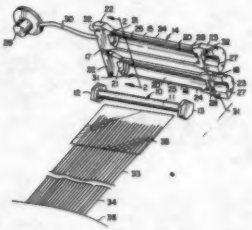
METHOD AND APPARATUS FOR ISOLATION OF HAIR FROM TREATMENT MATERIALS

Donald R. Smith, Rock Hill, S.C., assignor to Michael H. King, Tega Cay, S.C., a part interest

Filed Jan. 7, 1985, Ser. No. 689,463

Int. Cl.[4] A45D *7/00*

U.S. Cl. 132—7 **7 Claims**



5. A method of protecting a portion of hair from hair treatment chemicals applied to an unprotected portion of hair on a person's head, said method comprising the steps of:

(a) providing a core,

(b) wrapping a portion of hair to be protected on the core,

(c) providing a protective socket extendable about the core with the protected portion of hair wound thereon,

(d) placing the core and the said protected portion of hair within the socket,

(e) closing the socket about the core and the protected portion of hair thereon with an unprotected portion of hair extending outwardly from the socket,

(f) releasably locking the socket to prevent relative movement between the core and socket and thereby retain the said protected portion of hair on the core within the socket,

(g) applying a conditioner to the unprotected hair extending from the socket to prevent entry of the hair treatment chemicals into the socket, and

(h) rolling an unprotected portion of hair around the socket.

4,638,822

HAIR-SETTING PROCESS

Jean-Francois Grollier; Claire Fiquet; Chantal Fourcadier, all of Paris; Claude Dubief, Le Chesnay, and Daniele Cauwet, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Jul. 21, 1983, Ser. No. 516,052

Claims priority, application Luxembourg, Jul. 21, 1982, 84286

Int. Cl.[4] A45D *7/04;* A61K *7/09, 7/11*

U.S. Cl. 132—7 **35 Claims**

1. A hair-setting process, which comprises first treating the hair with at least one cationic polymer and at least one anionic

polymer, in a solvent medium selected from the group consisting of water and a mixture of water and alcohol; drying the hair; and immediately after drying the hair, wetting or rinsing the hair with an aqueous composition; and then setting and drying the hair, said aqueous composition being selected from the group consisting of (1) water, (2) a mixture of water and a cationic polymer, (3) a mixture of water and a cationic surface-active agent, (4) a mixture of water, a cationic polymer and a cationic surface-active agent, (5) a mixture of water, a cationic polymer and an anionic polymer, (6) a mixture of water, a cationic surface-active agent and an anionic polymer, and (7) a mixture of water, a cationic polymer, a cationic surface-active agent and an anionic polymer.

4,638,823

FLUORIDE-COATED DENTAL FLOSS

Michael G. Newman, 809 Alma Real Dr., Pacific Palisades, Calif. 90272, and Fermin A. Carranza, Jr., 10577 Eastborne Ave., Los Angeles, Calif. 90024

Division of Ser. No. 475,234, Mar. 14, 1983, Pat. No. 4,548,219. This application Jun. 27, 1985, Ser. No. 749,262

Int. Cl.[4] A61C *15/00*

U.S. Cl. 132—91 **5 Claims**

1. Dental floss made by dissolving a fluoride composition in water, adding the mixture to melted water-soluble wax, and applying the mixture to dental floss.

4,638,824

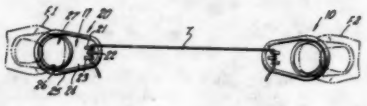
DENTAL FLOSS DEVICE

Jorge W. De La Hoz, 330 W. 10th St., Apt. #3, Hialeah, Fla. 33010

Filed Sep. 9, 1985, Ser. No. 773,869

Int. Cl.[4] A61C *15/00*

U.S. Cl. 132—91 **4 Claims**



1. A device for releasably holding dental floss in operative taughtness comprising:

A. a substantially flat substrate containing an aperture so arranged, sized and disposed to admit the passage thereinto of a human finger at an angle substantially normal to the plane of said substrate;

B. a lip, formed integrally with said aperture so as to remove any sharp internal edge from said aperture;

C. a deck formed on said substrate wherein said deck includes three prong means and said flat substrate has substantially a toroidal shape, and said prong means protruding therefrom for releasably holding said dental floss.

4,638,825

COIN COUNTER

Michael F. Gifford, San Jose, and James H. Coffman, Woodside, both of Calif., assignors to Coffman Systems, Inc., Burlingame, Calif.

Filed Jul. 1, 1985, Ser. No. 750,026

Int. Cl.[4] G07D *9/00*

U.S. Cl. 133—8 R **19 Claims**

1. In a coin-activated machine:

a coin-receiving device for accepting coins of a selected denomination;

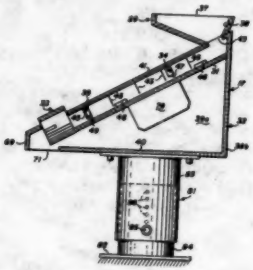
coin reservoir means mounted within the coin-receiving device for collecting said accepted coins;

a coin-counting device mounted in coin-flow communication with the reservoir means for receiving and counting coins which spill over from the reservoir means, the counting device including:

hopper means in spill over relation to the coin reservoir means to receive said coins spilling over from the reservoir means, the hopper means having an outlet for said coins;

an inclined planar member mounted to receive, at its upper ends, coins at said outlet of the hopper means to provide a face for coins to slide upon;

gate means mounted at spaced-apart locations transversely across the lower end of the inclined planar menber to count coins sliding downward on said face of the inclined planar member;



means mounted to extend across the inclined planar member at a distance thereabove sufficient to prevent two or more coins from sliding one atop the other, into the gate means; and

a plurality of spaced-apart resilient pin members mounted to extend downwardly toward said face of the inclined planar member and terminate less than one coin width distance above said face of the inclined planar member such that coins sliding down said face of the inclined planar member strike said pin members and are dispersed laterally across said face.

4,638,826

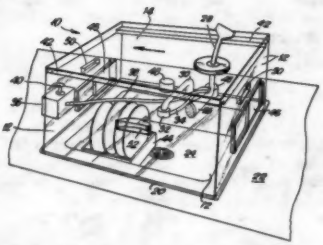
DISHWASHING APPARATUS

Joseph F. Canosa, 5701 Blvd. E, Apt. 3A, West New York, N.J. 07093

Filed Jun. 26, 1985, Ser. No. 749,106

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—100 **17 Claims**



1. Apparatus for placement over a sink to facilitate the washing of dishes and the like, comprising:

an enclosure formed, at least in part, of a substantially translucent plastic material, said enclosure having side portions and a top portion;

sealing means disposed along lower edges of said side portions of said enclosure, for substantially sealing the interior of said enclosure from the exterior thereof, when said

lower edges of said side portions are disposed about the perimeter of said sink;

a nozzle connected to said enclosure and disposed on the interior thereof;

means for connecting said nozzle to a faucet on said sink;

means for supplying a detergent to the interior of said enclosure; and

means for manually moving said nozzle from the exterior of said enclosure.

4,638,827

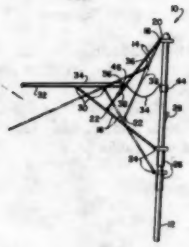
FOLDING UMBRELLA

Joseph DeMarco, 60 Seaman Ave., New York, N.Y. 10034

Filed Jun. 7, 1985, Ser. No. 742,316

Int. Cl.[4] A45B *19/06, 11/00*

U.S. Cl. 135—26 **2 Claims**



1. A folding umbrella comprising a central rod having an upper and a lower end, a plurality of circumferentially spaced ribs each having a slide at one end and each of a length less than the intended radius of the umbrella, a fabric cover of a size coextensive with the intended radius of the umbrella disposed over said ribs, and an articulating strut arrangement for extending said ribs outwardly with respect to said rod to deploy said cover and for folding said ribs and cover toward said rod, said strut arrangement comprising a set of upper struts and a set of lower struts, each set having a number corresponding to the number of said ribs and arranged in associated triads, the upper strut of each triad being hinged at one end to the upper end of said rod and at its other end to a correspondingly lower strut medial of the ends of said lower strut, the lower strut in each pair being hinged at one end to a corresponding rib which has said slide thereon disposed about a corresponding upper strut for movement up and down therealong and being connected at its other end to a slide runner disposed for sliding movement up and down along said rod, the downward movement of said slide runner causing said lower and upper struts to extend outwardly from the rod forming therewith a triangle and opening said cover thereon to the fullest size thereof corresponding to the intended radius of the umbrella, and the downward movement of said slide runner causing said lower and upper struts to fold against said rod substantially parallel therewith simultaneously with causing a folding in said cover above said slides of said ribs whereby said cover in said closed umbrella is of a reduced radial extent equal to that of said ribs.

4,638,828

WATER TEMPERATURE ACTUATED DRIP VALVE

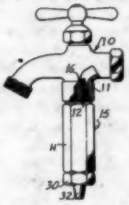
Wyman L. Barrineau, Sr., 20 Loring Pl., and Julius P. Barrineau, 944 Morningside Dr., both of, Sumter, S.C. 29150

Filed Oct. 22, 1985, Ser. No. 790,065

Int. Cl.[4] F16K *17/00;* **G05D** *23/02*

U.S. Cl. 137—62 **4 Claims**

1. A self actuating drip valve in combination with a water pipe for preventing freezing of water in said water pipe, said drip valve comprising an elongate housing defining an opening therethrough, a portion of said opening including a central threaded hole, and a plurality of additional holes radially outward of said threaded hole, a temperature sensing means received within said opening at one end thereof for being contacted by said water in said water pipe, said temperature sensing means including an externally threaded end threadedly engaged with said central threaded hole, a tip projectable at high temperatures and retractable at near-freezing temperatures, a plunger within said opening in said housing and located to be directly and adjustably engaged by said tip for urging said plunger downwardly, said plunger including a head slidable within said opening, said head having flat faces for defining water passages between said flat faces and said opening, a round section below said head, said round section having a smaller diameter than the diameter of said opening, and a sealing means at the lower end of said round section, a seat



assembly received within said opening of said housing, said seat assembly including a bore for receiving said round section of said plunger with said sealing means, a valve seat defined within said bore, and a spring held by said seat assembly for urging said plunger upwardly, said valve seat being selectively engageable by said sealing means, said additional holes allowing water flow through said housing adjacent to said temperature sensing means, said plunger allowing water flow through said opening in said housing to said sealing means, the arrangement being such that engagement of said sealing means with said valve seat prevents water flow through said housing, and motion of said sealing means towards and away from said valve seat allows varying water flow which is dependent upon the direct and adjustable engagement between said tip and said plunger.

4,638,829

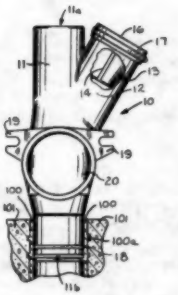
FIRESTOP FITTING FOR CARRIER MOUNTED WATER CLOSETS

Kenneth R. Cornwall, 902 Summit North, Atlanta, Ga. 30324

Continuation-in-part of Ser. No. 555,121, Nov. 25, 1983, Pat. No. 4,583,565. This application May 9, 1985, Ser. No. 732,055

Int. Cl.[4] F16K *17/14*

U.S. Cl. 137—75 **8 Claims**



1. An improved one piece fitting for a fluid connection to a

water closet which is supported on a carrier mounted on a floor of a building and which fitting prevents spread of fire between the floor of the building through a plastic pipe connected to the fitting which comprises:

(a) a non-flammable, fluid carrying main conduit having a first longitudinal axis between two opposed openings defining an inside diameter of the main conduit and an enlarged chamber between the openings and adapted to be connected into plastic pipes between floors of a building;

(b) a non-flammable extension conduit from the enlarged chamber of the main conduit positioned with a second axis at an acute angle from the longitudinal axis of the main conduit with an opening;

(c) a non-flammable plug having a diameter larger than the inside diameter of the main conduit and smaller than the enlarged chamber mounted in the extension conduit on a plastic support mounted on the extension conduit which is releasable by melting upon exposure of the support to heat less than necessary for heat destruction of the plastic pipe to which it is adapted to be fitted through the main conduit from a fire in the building in which it is adapted to be provided to thereby move into and close the main conduit, wherein the plastic support is provided by a harness with a strap upon which the plug rests, wherein the harness has two straps which are overlapping in an x pattern joined to a holding ring which is mounted inside the extension conduit and wherein the strap is broken by heat from a fire to release the plug which moves by gravity into the main conduit;

(d) closure means for the extension conduit opening;

(e) a short pipe connected to a side opening in the main conduit in the enlarged chamber for fluid connection to a water closet; and

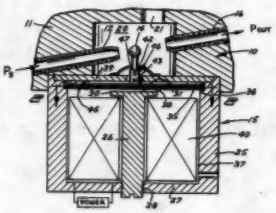
(f) attachment means on the fitting for connecting the fitting to the carrier.

4,638,830

HIGH SENSITIVITY MAGNETIC ACTUATOR

Gregory C. Brown, Chaska, and James L. Gravel, Prior Lake, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 27, 1985, Ser. No. 781,358
Int. Cl.[4] G05D *16/00*; F16K *31/08*
U.S. Cl. 137—83 **10 Claims**



1. A magnetic actuator for providing a mechanical actuation representative of an input current comprising:

a coil extending from a first end to a second end along a central axis and having an inner diameter about the central axis for producing a magnetomotive force in response to an input current;

a ferromagnetic core having first and second ends and positioned in the interior of the coil and having a pole face extending outwardly from the first end of the coil;

a housing formed of ferromagnetic material disposed around the coil and core, said housing having a first end plate in low reluctance contact with the second end of the core and a second end plate spaced from the pole face of the core, said second end plate having an aperture therethrough aligned with the pole face;

a diaphragm spring formed of a ferromagnetic material having an outer rim fastened to the housing and a central region, overlying the pole face and spaced from the second end plate and the pole face in a rest position, the central region of said diaphragm spring being deflectable proportional to the input current toward and away from the pole face; and

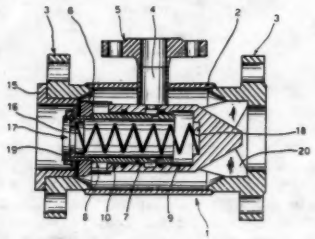
a permanent magnet mounted on the central region of the diaphragm spring and extending through the aperture in the second end plate, said permanent magnet being aligned along the central axis, a first permanent magnet pole face engaging the diaphragm spring on a side thereof opposite the pole face of the core, and a second permanent magnet pole face extending outside the housing.

4,638,831

VALVE ARRANGEMENT FOR UNLOADING LIQUID FLOW AT A NON-RETURN VALVE

Nils E. Lindgren, Borlänge, Sweden, assignor to SSAB Svenskt Stal AB, Stockholm, Sweden

PCT No. PCT/SE85/00189, § 371 Date Dec. 24, 1985, § 102(e) Date Dec. 24, 1985, PCT Pub. No. WO85/05430, PCT Pub. Date Dec. 5, 1985
PCT Filed Apr. 26, 1985, Ser. No. 828,758
Claims priority, application Sweden, May 11, 1984, 8402542
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—117 **6 Claims**



1. A minimum flow valve device which can be used in a fluid line connected to an operating centrifugal pump to supply cooling liquid thereto even when the fluid flow through the line is stopped, said valve device comprising

a housing which provides a liquid passageway therethrough, said liquid passageway having an inlet end and an outlet end and defining a center line therethrough,

an elongated guide element fixedly positioned in said liquid passageway in said housing so as to be aligned with said center line, said guide element including a sleeve portion nearest said inlet end of said liquid passageway and an end portion nearest said outlet end of said liquid passageway, said sleeve portion and said end portion defining an internal chamber which is open towards said inlet end and closed towards said outlet end of said liquid passageway; said sleeve portion having an outer surface and an inner sliding surface, an annular groove which is open towards said internal chamber and a discharge orifice which extends from said annular groove to said outer surface,

an unloading pipe which extends through said housing and connects with the outer surface of said sleeve portion of said guide element so as to communicate with said discharge orifice,

a non-return valve element which is movably positioned in said liquid passageway between said guide element and the inlet end of said liquid passageway, and

a valve sleeve member which is connected to said non-return valve element and is movable within said internal chamber of said guide element, said valve sleeve providing an internal channel therein and having an outer sliding surface which is slidingly movable with respect to the inner

sliding surface of the sleeve portion of said guide element and a plurality of orifices which extend therethrough in a common radial place; said non-return valve element and said valve sleeve being jointly movable back and forth from a first position where they block liquid flow through said liquid passageway to a second position where they allow liquid flow through said liquid passageway, said orifices in said valve sleeve being in communication with said annular groove in the sleeve portion of said guide element only when said non-return valve element and said valve sleeve member are in their first position, thus enabling liquid to flow from said inlet end of said liquid passageway, through said interior channel, through said discharge orifice and through said unloading pipe.

4,638,832

NONRETURN PISTON SLIDE VALVE

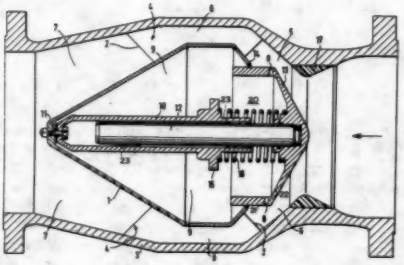
Nicolaas J. Mokveld, Reeuwijk, Netherlands, assignor to Mokveld Valves bv., Gouda, Netherlands

Continuation-in-part of Ser. No. 37,054, May 8, 1979, abandoned. This application Dec. 17, 1980, Ser. No. 217,213

Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821255

Int. Cl.[4] F16K *17/30, 21/10*

U.S. Cl. 137—220 **9 Claims**



1. A nonreturn piston slide valve having a longitudinal flow axis, said valve being normally open in response to flow of a medium in a desired direction through the valve, comprising inner housing means confining an inner space, outer housing means and means operatively securing said inner housing means coaxially in said outer housing means to form an annular flow passage coaxially through the valve, said annular flow passage forming a venturi action zone of maximum flow speed, said outer housing means comprising valve seat means adjacent the annular flow passage, said valve seat means defining a plane extending perpendicularly to said longitudinal flow axis, piston means having a valve closing piston face and piston wall means extending substantially coaxially to said longitudinal flow axis, said inner housing means having an axially facing opening (14), said piston means being coaxially supported inside said inner housing means in sliding relationship with said inner housing means through said axially facing opening (14) for cooperation with said valve seat means, spring means held in said inner housing means for biasing said piston means against said valve seat means to close the valve in response to a flow direction opposite to said desired flow direction, said spring means being constructed and arranged so that the valve piston means remains in the normally open position during flow through the valve in the desired direction, and aperture means (8) extending substantially radially to said flow axis through said piston wall means adjacent the piston face, said aperture means (8) operatively connecting said inner space of said inner housing with said maximum flow speed venturi action zone during a substantial first portion of a valve opening stroke of said piston means (21), while said aperture means (8) are moving with the piston means for avoiding secondary flows inside said inner housing means, for preventing oscillating movements of the piston means in any position of the piston means, and for facilitating a rapid opening of the valve, said opening (14) of said inner housing means being located relative to said aperture means (8), so that said aperture means (8) in the piston wall means (21) pass inside the inner housing means only during a second, short end portion of said valve opening stroke, thereby providing a pronounced hydraulic damping or braking action (32) during the short end portion of the valve opening stroke of the piston means, said aperture means (8) also limiting an initial valve closing speed of said piston means as long as the aperture means are still covered by the inner housing means at the beginning of a valve closing piston movement.

4,638,833

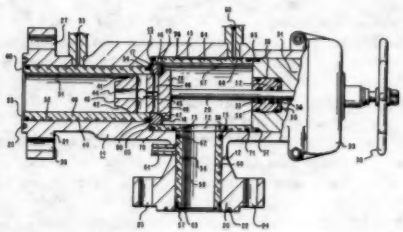
CHOKE VALVE

Herbert A. Wolcott, II, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 676,328, Nov. 29, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,118

Int. Cl.[4] F16K *1/34*

U.S. Cl. 137—312 **5 Claims**



1. A well flow line choke control valve comprising:

valve body means including a valve inlet flow passage adapted to be connected to a flow line, an inner surface defining a valve chamber, and a valve outlet flow passage adapted to be connected to a flow line;

valve seat means disposed in said body between said inlet flow passage and said outlet flow passage, said valve seat means having a valve seat flow passage extending therethrough;

valve throttle means adapted to be moved relative to said valve seat means and to control the rate of fluid flowing through said control valve;

liner means inside said valve body, said liner means having opposed ends and an inner surface defining a liner flow passage,

an inner surface of said valve body and an outer surface on said liner means adapted to define a monitoring flow passage for monitoring for a leak in said liner means, said monitoring flow passage being further defined by a spiralling groove formed in said outer surface on said liner means to provide for supportive engagement of said liner means between said inner surface of said valve body and said outer surface of said liner means;

a flow passage extending through said valve body and communicating with said monitoring flow passage; and

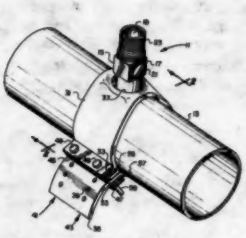
sealing means adapted to form a fluid-tight seal near respective ones of said ends of said liner means between said liner means and said valve body.

4,638,834

TAPPING SADDLE

Ronald S. Montgomery, 1308 Cherry St., Gainesville, Tex. 76240

Filed Sep. 20, 1985, Ser. No. 778,362
Int. Cl.[4] F16K *43/00, 51/00*
U.S. Cl. 137—315 2 Claims



1. A tapping saddle for establishing a lateral connection to a pipe which comprises:

a tapping valve;

a flexible metal band connected to said tapping valve, said metal band having first and second ends with a length therebetween sufficient to encircle the pipe, said metal band including a plurality of holes spaced apart lengthwise on said band adjacent said second end;

a first lug connected to said first end of said metal band;

a second lug positionable adjacent said first lug with said second end of said metal band extending between and beyond said first and second lugs;

bolt means passing through one of said holes for drawing together said first and second lugs;

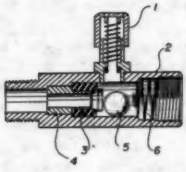
and urging means disposed between one of said lugs and said second end of said metal band for urging said second end of said metal band into contact with the other of said lugs when said first and second lugs are drawn together, and said urging means includes a tab connected to one of said lugs radially outward of said bolt means and engageable with the extended second end of said metal band for causing said first and second lugs to rotate as the metal band is tightened on the pipe.

4,638,835

AUTOMATIC OVERFLOW CONTROL APPARATUS FOR THE PIPELINE PASSAGE

Rong-Chao Chuang, 113 Nan-Yang Road, Nan-Tsu, Kao Hsiung, Taiwan

Filed Sep. 11, 1985, Ser. No. 775,025
Int. Cl.[4] F16K *17/24*
U.S. Cl. 137—519.5 10 Claims



1. In an automatic overflow control apparatus of the type having a housing, an inlet port connected to an external flow supply, an outlet port, a flow channel being positioned between, and in communication with the inlet port and the outlet port, and a safety valve having a ball member disposed in the flow channel, to prevent overflow through the apparatus, wherein the improvement being the safety valve comprising:

a main body portion having an inlet end and an outlet end;

a valve seat having an inlet end, and an outlet end being integrally formed on the inlet end of the main body portion and extending therefrom; and

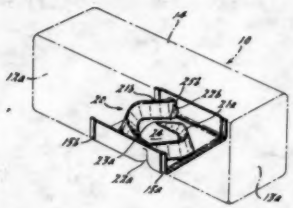
an elastic annular shell integrally formed on the inlet end of the valve seat, wherein the ball member may be seated in the valve seat, deforming the shell and being gripped therein, thereby sealing the flow channel.

4,638,836

MOTOR VEHICLE FUEL TANK WITH UNITARY FUEL RESERVOIR

Wallace O. Bailey, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 26, 1985, Ser. No. 727,700
Int. Cl.[4] B65D *1/24*
U.S. Cl. 137—574 7 Claims



1. A motor vehicle fuel tank having a fluid pressure thermoformed tank wall comprising a bottom wall and opposed side walls unitary with and extending upwardly from said bottom wall, said fuel tank comprising a fuel reservoir unitary with said tank wall and comprising two opposed substantially C-shaped ridges extending upwardly into said tank from the plane of said bottom wall, each said ridge being of certain height at a first end unitary with a corresponding one of said side walls and each said ridge fairing into said corresponding one of said side walls and extending toward the opposed side wall to a second end, said ridges each having a maximum height substantially less than the overall height of the tank and from a point remote from said second end diminishing in height substantially continuously to approximately the plane of said bottom wall, said ridges cooperating to partially surround a portion of said surface area of said bottom wall, a channel between the second end of each said ridge and the other said ridge extending substantially in the plane of said bottom wall to permit fuel to flow to said partially surrounded surface area from the remaining portion of the surface area of said bottom wall.

4,638,837

ELECTRO/PNEUMATIC PROPORTIONAL VALVE

James W. Buike, Union Lake, and William C. Eddy, West Bloomfield, both of Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 13, 1984, Ser. No. 670,686
Int. Cl.[4] F16K *31/06, 11/14;* F15B *13/043*
U.S. Cl. 137—627.5 19 Claims

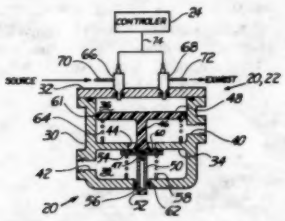
1. An electrically actuated proportional valve for outputting a fluid at a pressure proportional to at least one continuously variable component of an electrical signal comprising:

an enclosed housing defining an internal chamber, said housing having an inlet port for receiving a pressurized fluid, an outlet port, and vent port;

a piston disposed in said internal chamber operative to assume a first position and displaceable in response to a fluid pressure applied to one side of said piston;

first valve means, opened in response to said piston being in said first position to connect said outlet port to said vent port and closed in response to said piston being displaced from said first position;

second valve means closed in response to said piston being in said first position and opened in response to said piston being displaced from said first position to connect said outlet port with said inlet port, said second valve in said open state also applying a fluid pressure to the side of said piston opposite said one side to balance the position of said piston such that the fluid pressure at the outlet port is



proportional to the fluid pressure applied to said one side of the piston; and

electrically actuated pilot valve means responsive to the electrical signal for applying a fluid to said one side of said piston having a fluid pressure proportional to the value of the variable component of said electrical signal, said fluid pressure displacing said piston and opening said second valve means to produce a pressure applied to the other side of said piston and at said outlet port proportional to the value of the variable component of said electrical signal.

4,638,838

HYDROPNEUMATIC ACCUMULATOR

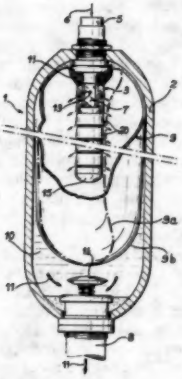
Philippe Richard, Bures sur Yvette; Jean-Charles Papillon, Fontenay le Fleury; Alain Guyot, Les Loges en Josas, and Carlo Corbellini, Sausset les Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 24, 1984, Ser. No. 633,920

Claims priority, application France, Aug. 4, 1983, 83 12895

Int. Cl.[4] F16L *55/04*

U.S. Cl. 138—30 **11 Claims**



1. A hydropneumatic accumulator with a bag, comprising a body having an inlet and an outlet, a bag made from a flexible, deformable material insulating the inlet from the outlet, a liquid contained in the bag on the outlet side, a tube connected to said inlet with openings on its side wall and closed at its end and a diffuser assembly mounted around the tube, wherein the diffuser assembly is made from a flexible material similar to that of the bag and has openings with a large passage cross-section compared with that of the openings in the tube, and wherein the diffuser assembly is constituted by diffuser rings, mounted on the tube with a given spacing, so as to provide an annular passage for a fluid between two successive rings.

4,638,839

GUIDE FOR THE GRIPPER CARRYING STRAPS INSIDE THE SHED OF WEAVING LOOMS

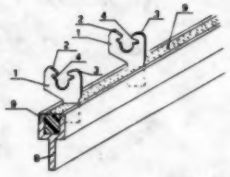
Nello Pezzoli, Leffe, Italy, assignor to Vamatex S.p.A., Villa Di Serio, Italy

Filed Oct. 10, 1984, Ser. No. 668,873

Claims priority, application Italy, Oct. 10, 1983, 23232 A/83

Int. Cl.[4] D03D *47/00*

U.S. Cl. 139—449 **1 Claim**



1. In a weaving loom having a reed, flat horizontal gripper-carrying straps mounted for reciprocal movement inside the shed of the loom, and a plurality of supports of said straps mounted adjacent said reed, each said support comprising an upright plate having two lateral beaks delimiting a seat for the strap, the seat including a portion below the strap having a central undercut area so as to support only the edges of said strap; the improvement comprising the beak closer to the reed being higher than the other beak, and in which the seat portion and the supported strap edges are downwardly inclined toward said central undercut area.

4,638,840

WEFT FEEDER FOR WEAVING LOOMS

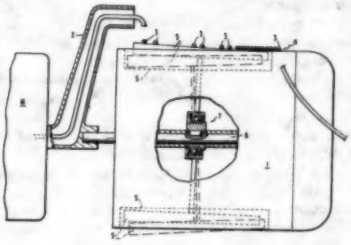
Fiorenzo Ghiardo, Vigliano Biellese, and Bruno Maina, Valdengo, both of Italy, assignors to ROJ Electrotex S.p.A., Biella, Italy

Filed May 28, 1985, Ser. No. 738,386

Claims priority, application Italy, Jun. 4, 1984, 21249 A/84

Int. Cl.[4] D03D *47/36*; B65H *51/20*

U.S. Cl. 139—452 **3 Claims**



1. A weft feeder for weaving looms, comprising a stationary drum, means to wind a weft yarn around the drum, a set of columns that extend along the drum from the feeder inlet end

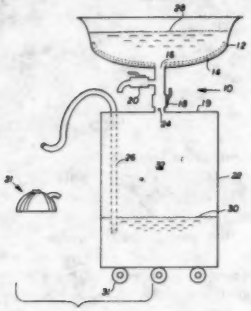
of the drum toward the outlet end of the drum and are disposed in seats in the periphery of the drum, a drive shaft disposed axially within the drum, a skew bushing on the drive shaft, and means mounting said columns on said skew bushing, the columns having outer surfaces inclined to the periphery of the drum such that upon rotation of the drive shaft, the skew bushing causes each column successively to take up a position in which the column has a portion adjacent said feeder inlet end which is substantially farther from the axis of the drum than is the periphery of the drum and a portion toward said feeder outlet end which extends radially outwardly of the drum no farther than the periphery of the drum, the drum having a portion of substantial axial extent adjacent said outlet end beyond which the columns do not extend, thereby to establish adjacent said outlet end a region on the drum in which the turns of weft yarn lie in contact with each other.

4,638,841

DEVICE FOR HANDLING FLUIDS DRAINED FROM A VEHICLE

Thomas E. Heath, 2630 Fujiama Dr., Clearwater, Fla. 33520

Filed Nov. 18, 1985, Ser. No. 799,149
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—98 **3 Claims**



1. A device for handling liquid fluids drained from vehicles, comprising:

a wide-mouth funnel having dimensions sufficient to collect fluid draining from a vehicle at widely spaced locations;

a storage tank in the form of a drum;

a funnel downspout member depending to said funnel, said downspout member disposed in fluid communicating relation to said funnel and said drum;

said drum having a substantially imperforate closure means;

a portable container for transiently holding fluids;

a drum bypass means;

a first valve member positioned in said drum bypass means;

said drum bypass means provided in the form of a passageway confluent with said downspout member and disposed normal thereto;

said drum bypass means communicating with said downspout member in an upper portion of said downspout member just downwardly of said funnel;

a second valve member, positioned in said downspout member below the intersection of said bypass means and said downspout member;

an air inlet member, positioned in said downspout member below said second valve member;

said air inlet means confluent with an air compressor means;

an elongate hose member having a first end immersed in fluid collected in said drum and having a second end extending outwardly of said drum through an aperture formed in the closure means for said drum;

said air compressor means adapted to introduce compressed air into said air inlet member so that when said second valve member is closed, compressed air enters said drum and expels fluids collected therein through said hose member to a fluid collection means positioned externally of said drum;

whereby when said first valve member is open and said second valve member is closed, fluid contained in said funnel is routed to said container;

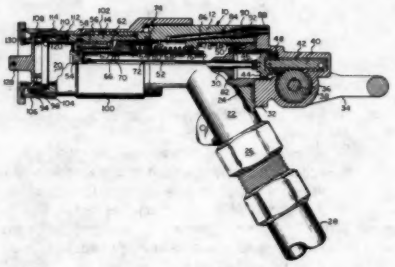
and whereby when said first valve member is closed and said second valve member is open, fluid contained in said funnel is routed to said drum.

4,638,842

CLOSED CIRCUIT REFUELING NOZZLE

Frank D. Hawley, Chelsea, and Russell L. Rogers, Munith, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Jul. 8, 1985, Ser. No. 752,837
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—302 **11 Claims**



1. A fueling nozzle for a closed circuit fuel system having a fuel tank inlet comprising, in combination, a hollow tubular body having an elongated passage having an inlet end and an outlet end, a fuel supply channel defined in said body in communication with said passage inlet end, releasable fuel tank inlet connection means defined on said body adjacent said passage outlet end movable between lock and release positions, operating means associated with said connection means mounted on said body movable between lock and release positions, an elongated plunger concentrically mounted within said elongated passage for axial movement between extended and retracted positions, said plunger having an inner end located adjacent said passage inlet end and an outer end adjacent said passage outlet end, an enlarged head mounted on said plunger outer end, plunger operating means mounted on said body connected to said plunger for translating said plunger between said extended and retracted positions, an annular valve sleeve sealingly received within said body passage adjacent to and accessible from said outlet end and axially displaceable between plunger head engaged and disengaged positions, engagement of said valve sleeve and plunger head closing said passage outlet end to fluid flow therethrough and connection of said body to a fuel tank inlet when said plunger is in said extended position disengaging said valve sleeve from said head to open said passage outlet end, first spring means axially biasing said valve sleeve toward said plunger head, an annular pressure regulator sleeve concentrically located within said body passage between said plunger head and passage inlet end axially displaceable within said passage and sealed with respect thereto, a valve seat defined within said body passage adjacent said passage inlet end in alignment with said regulator sleeve, valve means defined on said regulator sleeve engagable with said valve seat to close the interior of said regulator sleeve with respect to said fuel supply channel, differential pressure faces defined on said regulator sleeve exposed to the fluid pressure within said body passage imposing opposite axial forces on said regulator sleeve, and second spring means within said body imposing an axial force on said regulator sleeve tending to

separate said regulator sleeve valve means and said valve seat, a predetermined pressure within said body passage axially displacing said regulator sleeve against the force of said second spring to engage said valve means and valve seat and close the interior of said regulator sleeve with respect to said fuel supply channel.

4,638,843

METHOD FOR THE MANUFACTURE OF A VENEER BEAM

Hannu Sinko, Lahti, Finland, assignor to Raute Oy, Lahti, Finland

Filed Nov. 4, 1985, Ser. No. 794,386
Claims priority, application Finland, Dec. 5, 1984, 844824
Int. Cl.[4] B27D 1/00
U.S. Cl. 144—350 **7 Claims**

7. A method for producing beams from a plurality of laminated veneer beam blanks comprising:

providing a continuous setting comprising layered sheets of veneer with adhesive between the sheets but having at least one adhesive-free gap extending the width of the setting between the sheets;

dividing the setting along the gap into separate beam blanks;

passing each of the beam blanks into separate hot-press gaps to form a plurality of laminated veneer beam blanks; and

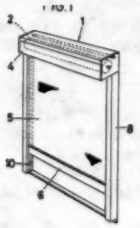
passing each of the laminated veneer beam blanks to separate means for sawing the blanks into beams.

4,638,844

WINDOW SCREEN

Seizo Hayashiguchi, 3454, Tsuoki, Sendo-cho, Tsu-shi, Mie, Japan

Filed Aug. 20, 1985, Ser. No. 767,510
Claims priority, application Japan, Feb. 1, 1985, 60-018978
Int. Cl.[4] E06B 9/08
U.S. Cl. 160—23 R **4 Claims**



1. A window screen comprising:

a frame having a pair of vertical stiles;

a casing provided at top of said frame;

a roller rotatably mounted in said casing;

a cover sheet wound around said roller with one end thereof secured thereto and having a bar secured to the other end thereof and having a fastener member attached to the side edges thereof over its entire length;

a rail provided in each of said stiles so as to extend vertically and formed with a groove to hold said fastener member therein; and

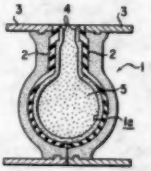
a bracket integral with said stiles for holding said rail, and cushioning members mounted between said bracket and said rail so as to press said rail toward said stile, said rails being loosely held in said bracket.

4,638,845

PROCESS FOR MAKING FOUNDRY MOLDS

Kanichi Sato; Mikio Setoyama; Shoji Kiguchi, all of Hirakata, and Toshio Tanaka, Daito, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,412
Claims priority, application Japan, Sep. 13, 1984, 59-190623
Int. Cl.[4] B22C 9/02, 9/12
U.S. Cl. 164—12 **12 Claims**



1. A process for making a foundry mold for use in metal casting, which comprises the steps of:

(a) heating and drying mold sand composed of refractory particles and a water-soluble binding agent;

(b) charging a cavity formed in a mold pattern with the dried mold sand while keeping, moisture on the inside surface of the cavity which corresponds to the peripheral surface of a mold to be made, and

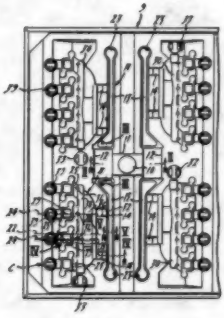
(c) heating the mole pattern of which the cavity has been filled completely with the mold sand to thereby cure the peripheral surface of the mold.

4,638,846

METHOD OF MAKING THIN-WALLED DUCTILE IRON CASTINGS

Allen D. Ackerman, Troy; Conrad G. Perkey, Dearborn Heights; Robert A. Martin, Northville, and William M. Justusson, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 1, 1980, Ser. No. 164,867
Int. Cl.[4] B22D 27/00
U.S. Cl. 164—55.1 **1 Claim**



1. A method of making a ductile iron casting in a mold assembly having walls defining first and second casting cavity portions with at least one thin space interconnecting said cavity portions, said thin space having a cross-sectional thickness dimension of 0.2 inches or less and a length of at least 12 times said dimension, and said thin space being the sole conduit for

filling the second of the cavity portions, the method comprising:

(a) introducing molten iron, of the type that would form gray iron with flake graphite if solidified untreated, to said mold assembly and, while in said mold assembly, treating said molten iron with a nodularizing/inoculating agent prior to the molten metal passing into the cavity portions;

(b) feeding the treated molten iron into said first mold cavity portion and thence into one extremity of said thin space; and

(c) while continuing to feed said treated molten iron to fill said mold assembly, creating a reservoir of treated molten iron at about a midstation of said thin space to be in series between said one extremity of said thin space and the remainder of said thin space and second cavity portion, said reservoir feeding molten iron to said remainder of the thin space after having passed from said one extremity, said reservoir also serving as an integral functional part of the casting when solidified.

4,638,847

METHOD OF FORMING ABRASIVE RESISTANT WHITE CAST IRON

Wallace Day, Columbus, Ga., assignor to GIW Industries, Inc., Grovetown, Ga.

Continuation-in-part of Ser. No. 600,552, Mar. 16, 1984, abandoned. This application Oct. 22, 1984, Ser. No. 663,669

Int. Cl.[4] B22D *27/00*

U.S. Cl. 164—55.1 **4 Claims**

1. The process of forming globular shaped carbides in cast iron comprising:

adding 0.001 to 4.0% boron to alloy cast iron comprising 0.001% to 30% vanadium, titanium, niobium, molybdenum, nickel, copper, tantalum or chromium or mixtures thereof and 1.8% to 4.5% carbon to form a molten cast iron composition, cooling said molten alloy cast iron composition below equilibrium solidification temperature to a super cooled temperature, for solidifying said molten cast iron composition to produce globular shaped carbides having an average size less than the average conventional cast iron carbide particle, continuing solidifying said molten cast iron composition by continuing to cool said molten cast iron composition to super cooled temperature to form globular shaped carbides having said average size less than about 4 microns.

4,638,848

METAL MOULD AND VENTHOLE ARRANGEMENT THEREOF

Kojiro Yamasaki, 10-10, Ikedauemachi, Nagata-Ku, Kobe-Shi, Hyogo 653, Japan

PCT No. PCT/JP81/00163, § 371 Date Dec. 16, 1982, § 102(e) Date Dec. 16, 1982, PCT Pub. No. WO83/00301, PCT Pub. Date Feb. 3, 1983

PCT Filed Jul. 15, 1981, Ser. No. 456,083

Int. Cl.[4] B22D *17/00*

U.S. Cl. 164—305 **3 Claims**

1. A metal mould comprising:

a removable half portion having an inner surface and a trapezoidal-shaped cross-sectional projection, said projection being integrally formed with and projecting inwardly from the inner surface of the removable half portion;

a vacuum pump in communication with the removable half portion;

a mating fixed half portion having an inner surface with a first recess means therein, said first recess means having dimensions larger than that of the projection on the removable half portion and being adapted to receive the projection in order to define a first cavity therewith when the inner surfaces of the removable and fixed half portions are mated together;

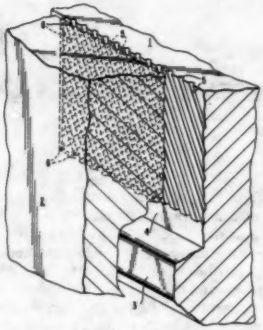
a venthole arrangement having

a plurality of upwardly extending parallel and spaced first inclined gas escape grooves having lower inlet ends and upper outlet ends, said first grooves being formed in the inner surface of the removable half portion in communication at said lower inlet ends with the first cavity;

a horizontally oriented second safety cavity having a bottom and being formed in the removable half portion in communication at said bottom with the upper outlet ends of the first grooves;

a hole means, having two ends and being formed in the removable half portion, for communicating at one end with the safety cavity and at the other end with the vacuum pump; and

a plurality of upwardly extending parallel and spaced second inclined gas escape grooves having two ends and being formed in the inner surface of the fixed half



portion in opposing relationship to the first grooves in communication at one end with the lower inlet ends of the first grooves leading to the first cavity and in communication at the other end with the upper outlet ends of the first grooves leading to the safety cavity;

said first and second grooves being inclined at an angle within a range of about 5° to about 85° with respect to a vertical axis and extending in opposite directions to each other so that a criss-cross pattern with cross points is formed;

whereby molten metal flowing through the first and second grooves impinges at the cross points and is prevented from forming a laminar flow, which causes appreciable differences in cooling, while gas between the mated removable and fixed half portions is positively discharged therefrom.

4,638,849

NOZZLE ASSEMBLY FOR DIE CASTING APPARATUS

Sydney H. Whitehorn, Birmingham, Mich., assignor to VSI Corporation, Pasadena, Calif.

Filed Aug. 25, 1985, Ser. No. 779,984

Int. Cl.[4] B22D *17/02*

U.S. Cl. 164—311 **6 Claims**

1. A nozzle assembly for conducting molten metal from a molten metal source to a die casting mold, said assembly comprising:

A. an elongated relatively large diameter nozzle main body section having an axial through passage adapted to receive molten metal at its inlet end from said source;

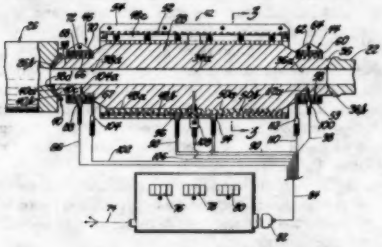
B. an elongated relatively small diameter outlet nozzle tip section having a through axial bore coaxial with the through bore in said nozzle main body section;

C. an elongated relatively small diameter inlet nozzle tip section having a through axial bore coaxial with the through bores in said nozzle main body section and said outlet nozzle tip section;

D. a separate heater assembly respectively wrapped around and extending for substantially the entire exposed axial

length of said nozzle main body section, said outlet nozzle tip section, and said inlet nozzle tip section; and

E. control means operative to separately sense the temperatures of said nozzle main body section, said outlet nozzle



tip section, and said inlet nozzle tip section and selectively and separately energize said heater assemblies to separately maintain predetermined set point nozzle body, outlet tip, and inlet tip temperatures.

4,638,850

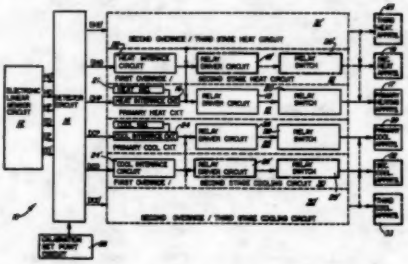
ELECTRONIC THERMOSTAT

Alfred T. Newell, III, Birmingham, Ala., and E. Lane Nichols, Clearwater, Fla., assignors to A. T. Newell Co. Inc., Birmingham, Ala.

Division of Ser. No. 584,398, Feb. 28, 1984. This application Dec. 18, 1984, Ser. No. 683,009

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—26 **5 Claims**



1. An electronic thermostat for controlling both cooling and heating apparatus, comprising:

means for sensing the temperature;

means for controlling the heating apparatus in response to the temperature sensing means including

primary means for actuating the heating apparatus in response to the sensed temperature decreasing below a preselected set temperature, said heat apparatus actuating means causing continuous actuation of the heating apparatus and including a primary actuating means responsive to the set temperature, and a separate override actuating means responsive to said sensed temperature decreasing below a heat override temperature which is less than said set temperature by a preselected increment to actuate the heating apparatus independently of actuation thereof by said primary means;

means for deactuating the heating apparatus in response to the sensed temperature rinsing to a heat deactuating temperature slightly greater than said set temperature to establish a hysteresis characteristic in the actuation and deactuation of the heating apparatus; and

means for controlling the cooling apparatus in response to said temperature sensing means including

means for actuating the cooling apparatus in response to the sensed temperature rising to a cool actuation temperature greater than said heat deactuation temperature to establish a preselected dead zone between heating and cooling cycles, and

means for deactuating the cooling apparatus when the second temperature decreases to a preselected cool deactuation temperature which is slightly less than said cool actuation temperature to establish a hysteresis characteristic in the actuation and deactuation of the cooling apparatus; and

means for selectively varying the temperature increment between said set temperature and said cool actuation temperature to alter said dead zone.

4,638,851

COOLING APPARATUS FOR METAL STRIP

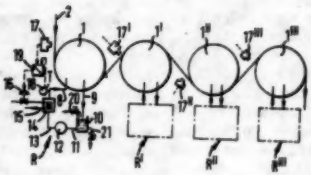
Katsumi Makihara; Kenichi Yanagi; Takeo Fukushima, all of Hiroshima; Namio Suganuma, Kurashiki; Ichiro Samejima, Kurashiki, and Seiichi Takahashi, Kurashiki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Kawasaki Steel Coporation, both of Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 722,213

Claims priority, application Japan, Apr. 17, 1984, 59-75809

Int. Cl.[4] B21B *13/02*

U.S. Cl. 165—32 **7 Claims**



1. An apparatus for cooling metal strip, comprising:

a plurality of cooling rolls disposed for having the strip pass successively thereacross in contact with a segment of the outer circumferential surfaces thereof;

means for passing a respective flow of coolant through each of said cooling rolls so as to cool the strip as the strip passes across said cooling rolls; and

a plurality of temperature detectors and a plurality of coolant temperature adjusters, one each of said detectors and said adjusters being associated with a respective one of said cooling rolls, each of said detectors comprising a means for detecting the temperature of the strip prior to contact of the strip with the associated cooling roll and a means for providing a strip temperature signal indicative of said temperature, each of said adjusters comprising a means for adjusting the temperature of the coolant passing through the associated cooling roll to a corresponding predetermined temperature range in response to the strip temperature from said strip temperature signal providing means of the temperature detector associated with said associated cooling roll, so as to limit the temperature drop of the strip as it passes across the associated cooling roll, to thereby limit temperature related irregularities and distortion in the configuration of the strip;

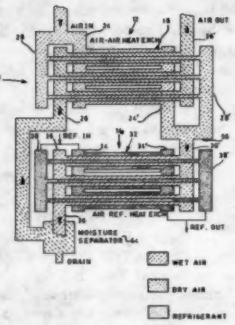
said means for passing a respective flow of coolant comprising means for passing through each cooling roll a respective flow of liquid coolant having a liquid state in the predetermined temperature range corresponding to the adjuster associated with said each cooling roll.

4,638,852

AIR DRYER FOR PNEUMATIC SYSTEMS

Sanjiv K. Basseen, 131 Bay Path Dr., Oak Ridge, Tenn. 37830, and Richard A. Harlan, Rte. 2, Box 1081, Wartburg, Tenn. 37887

Filed Aug. 16, 1985, Ser. No. 766,835
Int. Cl.[4] F25D *17/06*; F28D *7/10*; F25J *3/08*; F28B *9/10*
U.S. Cl. 165—47 **7 Claims**



1. A heat exchanger system for removing moisture from compressed air that is to be used in a pneumatic system, which comprises:

a first heat exchanger portion substantially arranged in a first plane, said first heat exchanger portion having

(a) a first plurality of substantially parallel straight tube units, each tube unit formed of three concentric tubes defining an inner channel, an intermediate annulus and an outer annulus, each of said tube units having a first end and a further end,

(b) first and second groups of first, second and third straight headers attached, respectively, to said first and further ends of each of said first tube units, said first header of each group being in fluid communication with said inner channels, said second header of each group being in fluid communication with said intermediate annuli and said third header of each group being in fluid communication with said outer annuli,

(c) a first inlet attached to and in fluid communication with said first and third headers of said first group, said first inlet adapted to receive a flow of said compressed air for said pneumatic system,

(d) a second inlet attached to and in fluid communication with said second header of said first group,

(e) a first outlet attached to and in communication with said first and third headers of said second group, and

(f) a second outlet attached to and in communication with said second header of said second group, said second outlet adapted to deliver demoisturized air to said pneumatic system;

a second heat exchanger portion substantially arranged in a second plane substantially parallel to said first plane, said second heat exchanger portion having,

(a) a second plurality of substantially parallel straight tube units, each of said tube units formed of three concentric tubes defining an inner channel, an intermediate annulus and an outer annulus, each of said tube units having a first end and a further end,

(b) third and fourth groups of first, second and third straight headers attached, respectively, to said first and further ends of each of said second tube units, said first header of each group being in fluid communication with said inner channels, said second header of each group being in fluid communication with said intermediate annuli, said third header of each group being in fluid communication with said outer annuli,

(c) a third inlet attached to and in fluid communication with said first and third headers of said third group,

(d) a fourth inlet attached to and in fluid communication with said first outlet of said first heat exchanger portion and said second header of said fourth group adapted to receive a flow of air from said first heat exchanger portion,

(e) a third outlet attached to an in fluid communication with said second header of said third group, and

(f) a fourth outlet attached to and in fluid communication with said first and third headers of said fourth group;

a centrifugal moisture separator connected to, and in communication with, said third outlet of said second heat exchanger portion and said second inlet of said first heat exchanger portion to remove entrained moisture from air passing through said second portion and return demoisturized air to said first heat exchanger portion; and

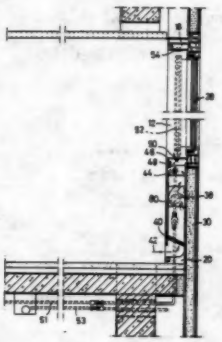
means for introducing a flow of refrigerant into said third inlet of said second heat exchanger portion, and for removing said refrigerant from said fourth outlet of said second heat exchanger portion.

4,638,853

APPARATUS FOR CONDITIONING AND CONTROLLING THE TEMPERATURE OF ROOMS IN A BUILDING

Viktor Papak, Aachen, Fed. Rep. of Germany, assignor to Josef Gartner & Co., Donau, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,298
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327459; Aug. 23, 1983, 3330394
Int. Cl.[4] F24F *3/06*
U.S. Cl. 165—50 **28 Claims**



1. Apparatus for conditioning the environment within a room or room area of a building bounded by a facade wall or walls thereof including means defining a function field of said apparatus comprising, with reference to a floor level of said room or room area to which it applies, and in a wall portion thereof, at least one pair of laterally spaced hollow uprights interconnected with and bridged by a plurality of hollow cross bars which are vertically spaced and include upper, lower and intermediately positioned cross bars, an intermediate of said cross bars being a railing cross bar which bounds one limit of the vertical extent of a railing zone of said function field the opposite limit of which is defined by another of said cross bars and the lateral limits of which are defined by portions of said one pair of uprights, said hollow uprights and cross bars defining a framework including therein means defining a flow path interconnected with means extending through said railing zone for delivering thereto and inducing the passage therethrough of a flow of hot or cold liquid, as needs require, means in connection with and within the railing zone of said framework including a cross stream blower defining a passage for movement of air from an inlet thereto, which is upstream of said blower and communicates with the interior of said room or room area the environment of which must be conditioned, to an interior portion of said railing cross bar, said cross stream

blower, when energized, being operative to draw air from said room or room area through said inlet and deliver it to and through said railing zone and to and from said railing cross bar in the process of which to inherently subject said air to the influence of said hot or cold liquid and means providing for discharge of said air so conditioned by way of openings from one or more of said hollow uprights and vertically spaced cross bars directly back to said room or room area from which said air was originally drawn, thereby to provide a simple, complete and highly effective system for conditioning the environment thereof.

4,638,854

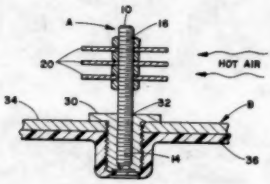
HEAT PIPE ASSEMBLY

Don W. Noren, 846 Blandford Blvd., Redwood City, Calif. 94062

Filed Jun. 15, 1983, Ser. No. 504,527

Int. Cl.[4] F28D *15/00*; F28F *1/30*

U.S. Cl. 165—76 **16 Claims**



1. A means for accurately controlling the transfer of heat to or from a device, comprising:

a heat pipe having a condenser end and an evaporator end;

a first securing means for securing the heat pipe to a desired section of the device;

a heat sink means includings a plurality of fins which are each selectively positionable on the heat pipe for selectively controlling the amount of heat transferred between the surrounding environment and said heat pipe; and

a second securing means for securing the heat sink means to the heat pipe, wherein the second securing means comprises at least one nut selectively threadable onto a threaded exterior periphery of the heat pipe and wherein at least two nuts are provided, one nut being threaded on either side of each of said fins to secure each fin in position on the heat pipe, and to space each fin from each adjacent fin.

4,638,855

HEAT EXCHANGE TREATMENT OF FLUIDS

Carl L. Elmore; Ted M. Poulin, and Mark D. Barrett, all of Glens Falls, N.Y., assignors to Kamyr, Inc., Karlstad, Sweden

Division of Ser. No. 480,752, Mar. 31, 1983, Pat. No. 4,519,446.

This application Aug. 3, 1984, Ser. No. 637,574

Int. Cl.[4] F28F *27/02*

U.S. Cl. 165—101 **12 Claims**

1. An assembly for treating process fluids to effect heat-exchange therebetween, comprising:

a plurality of vertically arranged pairs of heat-transfer plates disposed in pairs and are disposed in an annular arrangement around the interior of a vertical vessel;

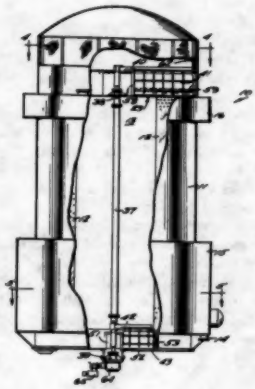
means for passing a heated fluid between pairs of said plates to reduce the heat content of said fluid, and returning said fluid with reduced heat content to a source;

means effecting a first flow of liquid over the exterior surfaces of a plurality of said heat-transfer plates;

means for effecting a second flow of liquid over the exterior surfaces of a second plurality of said heat-transfer plates;

means for segregating said first and second flows so that liquid in said first and second flows does not intermix comprising first and second liquid inlets disposed at the top of said vessel on the opposite sides of a top fixed radially extending baffle, and first and second outlets disposed at the bottom of the said vessel on the opposite sides of a bottom radially extending fixed baffle; and

means for adjusting the number of heat-transfer plates the liquid in said first flow comes in contact with, with respect



to the number of heat-transfer plates the liquid in said second flow comes in contact with, comprising top and bottom movable baffles rotatable by a central shaft to vary the arcuate spacing between said movable baffle and each of said first and second liquid inlets and outlets.

4,638,856

OIL FILTER AND COOLER FOR INTERNAL COMBUSTION ENGINE

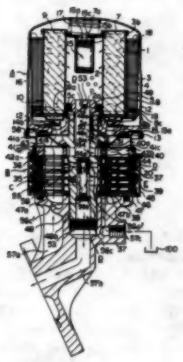
Yasutoshi Yamanaka, Kariya; Kazunobu Ageishi, Toyota, and Teruo Izumida, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 5, 1985, Ser. No. 762,533

Claims priority, application Japan, Aug. 7, 1984, 59-166227

Int. Cl.[4] F28F *19/00*

U.S. Cl. 165—119 **6 Claims**



1. A heat exchanger apparatus comprising:

a heat exchanger constituted by a multiplicity of heat exchanger units laminated one upon another;

a filter having first and second filter elements for removing any unnecessary substance mixed into a working fluid;

holding means, including an end plate, for holding said filter therein;

a fixing member having a cylindrical end portion to which said end plate faces and disposed such as to extend through said heat exchanger so that said heat exchanger and said filter are integrally secured to each other;

a communicating passage provided within said heat exchanger such as to communicate with the upstream side of said first and second filter elements;

a main flow passage provided within said heat exchanger such as to communicate with the downstream side of said first filter element;

a subsidiary flow passage provided within said heat exchanger such as to communicate with the downstream side of said second filter element;

single seal means for separating said main flow passage and subsidiary flow passage, said seal means being contacting at said end portion of said fixing member so that said seal means travels only a short distance on an outer surface of said end portion of said fixing member when said filter is fixed with said fixing member; and

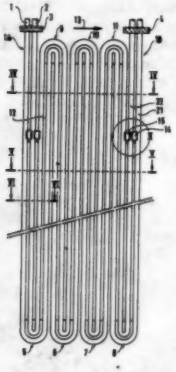
embracing means provided in said end plate, including three wall means, for embracing all surfaces of said seal means except one surface on which said end portion of said fixing member abuts.

4,638,857

VERTICAL TUBE HEAT EXCHANGER PANEL FOR WASTE-RECOVERY BOILERS SUCH AS BLACK LIQUID BOILERS OR HOUSEHOLD WASTE INCINERATOR FURNACES, AND METHODS OF MANUFACTURE

Jean Fournier, Rochefort En, France, assignor to Stein Industrie, France

Filed Jun. 5, 1985, Ser. No. 741,335
Claims priority, application France, Jun. 5, 1984, 84 08787
Int. Cl.[4] F22B *37/24*
U.S. Cl. 165—162 **6 Claims**



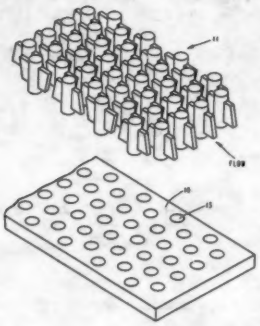
1. In a heat exchanger panel comprising; a plurality of vertical tubes interconnected alternately by top loops and by bottom loops to extend in a sinuous path from an inlet to an outlet, the improvement comprising: means fixed to said inlet and outlet of said vertical tubes for suspending said panel from a rigid structure solely via said inlet and said outlet, and wherein tubes come into contact via their outer surfaces with a soot-laden gas and are subject to differential thermal expansion from the inlet to the outlet, adjacent vertical tubes being separated from one another at a pitch which is a little greater than their diameter and being laterally interconnected by longitudinal fins, and wherein short fixing members are welded on either side to adjacent tubes at a level which is below the level of the top loops of the panel to fix the end ones of said tubes which are directly suspended from said rigid structure to one another and to the immediately adjacent tube with is not directly suspended thereby, with the interconnecting fins between said end tubes and said immediately adjacent tubes extending below said short fixing members, but not thereabove.

4,638,858

COMPOSITE HEAT TRANSFER DEVICE WITH PINS HAVING WINGS ALTERNATELY ORIENTED FOR UP-DOWN FLOW

Richard C. Chu, Poughkeepsie, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 16, 1985, Ser. No. 787,868
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—185 **9 Claims**



1. A heat transfer device with improved composite pin fins, comprising,

a base to be cooled or heated by a fluid directed across a surface of the base,

pins of a heat conducting material mounted on the surface of the base in columns in the direction for fluid flow,

wings attached to the pins and extending generally in the upstream and downstream directions of fluid flow, the wings in combination with the associated pin having a generally trapezoidal shape as viewed along the surface of the base at right angles to the direction of fluid flow, the trapezoid shape having a short parallel edge and a long parallel edge generally parallel to the base and having two non-parallel edges,

the composite pin fins along the direction of fluid flow being oriented with the short parallel edges alternately near the edges of wings of consective composite pin fins being spaced apart,

the pins being substantially uniform in cross section whereby the pin provides substantially the same heat transfer characteristics and impedance to the fluid flow in either orientation of the pin fin,

whereby the fluid flow is retarded by the drag from the surface of the wings more near the long parallel edge of the wings than near the short parallel edge and consequently the fluid flow past the wings is deflected toward the short parallel edge and an up-down corrugated flow is produced for improved heat transfer.

4,638,859

GRAVEL PACKER

Gary D. Zunkel, Chickasha, Okla., and Michael L. Bolin, Knoxville, Tenn., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 757,040
Int. Cl.[4] F21B *43/04*
U.S. Cl. 166—51 **20 Claims**

1. A retrievable gravel packer for placing a gravel pack in a

wellbore about a gravel screen disposed therebelow across a producing formation comprising:

a gravel packer assembly;

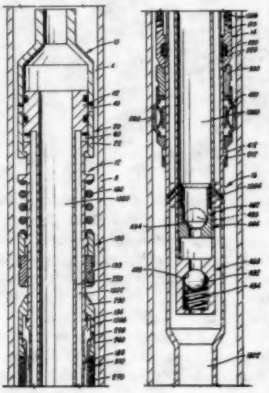
a packer element disposed on the exterior of said assembly;

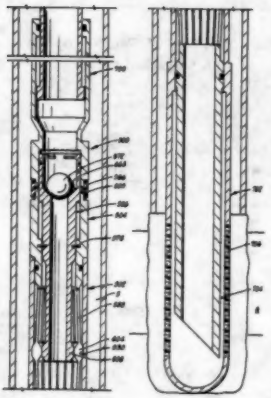
J-slot means in said assembly for selectively maintaining said packer element in an unset mode;

ratchet means in said assembly for releasably locking said packer element in a set mode;

an intake passage in said assembly for receiving fluid from a tubing string in said well bore above and secured to said gravel packer;

a return passage for receiving fluid from the interior of said gravel screen;





a circulation passage extending from the exterior of said gravel packer below said packer element to said intake passage;

closeable crossover means to receive fluid from said return passage and guide said received fluid from said return passage to the exterior of said assembly above said packer element;

first check valve means for preventing back flow to said intake passage from the interior of said gravel screen;

second check valve means adapted to selectively open said intake passage to said circulation passage in response to a positive pressure differential between the exterior of said gravel packer and said intake passage; and

check valve release means for inactivating said second check valve means in response to a fluid pressure buildup in said intake passage thereabove.

4,638,860

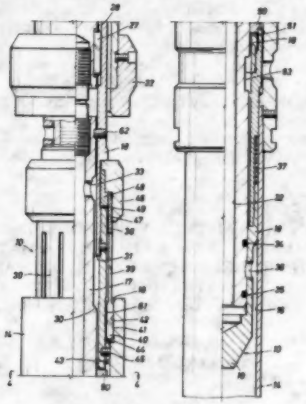
APPARATUS FOR BLOCKING COMMUNICATION BETWEEN WELL BORE INTERVALS

Robert L. Magee, Jr., Fort Worth, and Marvin B. Traweek, IV, Houston, both of Tex., assignors to Arlington Automatics Inc., Grand Prairie, Tex.

Filed Jan. 31, 1986, Ser. No. 825,085

Int. Cl.[4] E21B *33/10*

U.S. Cl. 166—114 **11 Claims**



1. Apparatus adapted to be moved into the upwardly-opening axial bore of a central member of a packer anchored in a well bore for selectively closing communication between formation intervals above and below the packer and comprising:

a tubular body adapted to be telescopically disposed within an internally-threaded upper bore portion and a smooth-wall lower bore portion in the central packer member;

seal means on said body for sealingly engaging the smooth-wall bore to block communication therethrough around said body;

a mandrel telescopically arranged within said body and adapted for longitudinal movement between upper and lower positions;

bypass means cooperatively arranged for closing communication through said body in one position of said mandrel and for opening said communication in the other position and said mandrel;

latching means including a plurality of flexible collet fingers dependently secured around said body having externally-threaded enlarged heads cooperatively arranged for threadedly engaging the internally-threaded bore portion to anchor said body within the the central packer member; and

retaining means including a retaining member cooperatively mounted on said mandrel and movable against said collet fingers in response to upward movement of said mandrel for threadedly engaging said enlarged heads within the internally-threaded bore portion, and means normally securing said retainer member to said mandrel and operable only in response to a force on said mandrel of at least a predetermined magnitude to release said retainer member for movement away from said enlarged heads.

4,638,861

METHOD FOR TREATING THE BOTTOM-HOLE FORMATION ZONE

David A. Kaushansky, Moscow, U.S.S.R., assignor to Moskovsky Institut Neftekhimicheskoi i Gazovoi Promyshlennosti, Moscow, U.S.S.R.

PCT No. PCT/SU84/00034, § 371 Date Mar. 11, 1985, § 102(e) Date Mar. 11, 1985, PCT Pub. No. WO85/00403, PCT Pub. Date Jan. 31, 1985

PCT Filed Jul. 11, 1984, Ser. No. 740,072

Claims priority, application U.S.S.R., Jul. 12, 1983, 3611705

Int. Cl.[4] E21B *21/00, 41/02, 43/27*

U.S. Cl. 166—247 7 Claims

1. A method for treating a bottom-hole formation zone comprising the steps of

irradiating the zone with a bactericidal agent comprising gamma rays at a dose of at least 300 krad, and

maintaining the pressure within said zone between 2 and 50 MPa during said irradiating step.

6. A method for treating a bottom-hole formation zone comprising the steps of

irradiating the zone with a bactericidal agent comprising gamma rays at a dose of at least 150 krad,

maintaining the pressure within said zone between 2 and 50 MPa during said irradiating step, and

treating said zone with a chemical bactericidal agent at regular intervals during said irradiating step.

4,638,862

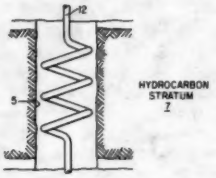
MEANS AND METHOD FOR PRODUCING HYDROCARBONS FROM AN EARTH FORMATION DURING THE RF RETORTING OF A HYDROCARBON STRATUM

Kerry D. Savage, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 10, 1985, Ser. No. 786,393

Int. Cl.[4] E21B *43/00*

U.S. Cl. 166—248 7 Claims



1. A method for obtaining hydrocarbon liquid from a hydrocarbon strata of an earth formation traversed by a borehole, said hydrocarbon strata being subjected to RF electromagnetic energy retorting, comprising the steps of:

(a) forming metal tubing so as to create a tubing coil having a predetermined electrical inductance,

(b) connecting straight metal tubing with the metal tubing of step (a) so that the tubing of steps (a) and (b) form a production string, and

(c) pumping the hydrocarbon liquid from the borehole through the production string to the surface of the earth formation.

4,638,863

WELL PRODUCTION METHOD USING MICROWAVE HEATING

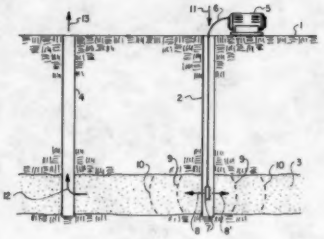
Robert Wilson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 25, 1986, Ser. No. 878,147

Int. Cl.[4] E21B *36/00, 43/24*

U.S. Cl. 166—248 10 Claims

1. In a method for stimulating the production of hydrocarbonaceous fluid from a subterranean geologic formation in the earth which contains both a hydrocarbonaceous fluid and a non-hydrocarbonaceous fluid which has a higher electrical conductivity than said hydrocarbonaceous fluid, said formation being penetrated by at least one wellbore, and microwave heating being employed in at least one wellbore to heat said formation and hydrocarbonaceous fluid contained therein to enhance the flow of said hydrocarbonaceous fluid into at least one wellbore for recovery of same at the surface of the earth, the improvement comprising displacing at least a portion of



said non-hydrocarbonaceous fluid which is in said formation near said wellbore away from said wellbore and further into said formation, the amount of non-hydrocarbonaceous fluid displaced being that which is effective to substantially reduce the overall electrical conductivity of said formation and its contained fluids in a finite volume around said wellbore thereby to increase the effectiveness of said microwave heating in said finite volume and stimulate the movement of said hydrocarbonaceous fluid in the portion of said formation from which said nonhydrocarbonaceous fluid has been displaced.

4,638,864

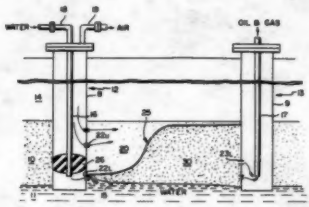
RECOVERY OF HEAVY CRUDE OIL FROM SHALLOW FORMATIONS BY IN SITU COMBUSTION

Issam S. Bousaid, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,669

Int. Cl.[4] E21B *43/243*

U.S. Cl. 166—251 7 Claims



1. The method of carrying out an in situ combustion operation for the production of hydrocarbons from an underground formation containing heavy crude oil, said formation being penetrated by an injection well and at least one production well and being underlain by a water stratum at an oil-water contact, which comprises

initiating in situ combustion in said formation in a zone adjacent said injection well,

introducing into said formation via said injection well bore to maintain in situ combustion therein a combustion-supporting gas at a pressure lower than that at which said gas would break through to the surface in order to propagate a combustion front to travel between said injection and production wells,

at a time determined from known relationships between

formation and operating parameters injecting water in said injection well at about the level of said oil-water contact to increase reservoir pressure acting against a combustion front as the latter moves toward the production well while continuing injection of combustion supporting gas into said formation, and

producing hydrocarbon fluids through said at least one production well.

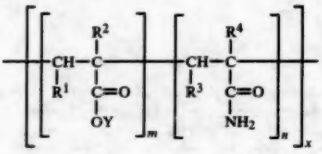
4,638,865

BIORESISTANT WATER-SOLUBLE ALKYL SUBSTITUTED ACRYLAMIDE POLYMERS AND ENHANCED OIL RECOVERY METHOD EMPLOYING SAME

Lawrence E. Ball, Akron; William M. Griffin, Chesterland; Kathleen M. Wallace, Chardon, and Amy L. Nemecek, Garfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 30, 1985, Ser. No. 739,478
Int. Cl.[4] E21B *43/16*
U.S. Cl. 166—274 **21 Claims**

1. A method for recovering oil from a subterranean formation comprising injecting into said formation an aqueous composition comprising a thickening amount of a polymeric thickener represented by the formula



wherein

Y is hydrogen, ammonium, an alkali metal or an alkaline earth metal,

R^1 and R^3 are hydrogen;

R^2 is an alkyl group of 2 to about 3 carbon atoms, and R^4 is hydrogen;

m is a number sufficient to provide the acid or salt portion of said polymer at a level of from about 10% to about 90% by weight of the total weight of said polymer,

n is a number sufficient to provide the amide portion of said polymer at a level of from about 10% to about 90% by weight of the total weight of said polymer, and

x is a number sufficient to provide said polymer with a molecular weight of at least about 100,000.

4,638,866

FIRE-SPRINKLER CUT-OFF DEVICE

Vincent Capasso, Lansdale, Pa., and Charles W. Kalck, Sr., 635 Camp Wawa Rd., Lederach, Pa. 19450, assignors to Charles W. Kalck, Sr. and Kathy Kalck, both of Lederach, Pa.

Filed Jan. 31, 1986, Ser. No. 824,729
Int. Cl.[4] A62C *39/00*
U.S. Cl. 169—90 **4 Claims**

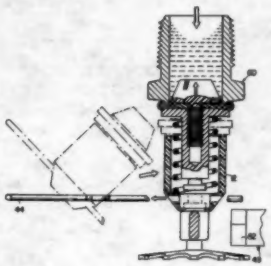
1. An apparatus for stopping the flow of water through an opening in a fire-sprinkler head, said fire-sprinkler head being of the type having a support frame spaced about and downstream of said opening, comprising:

a body member, composed of a meltable material and of a size allowing insertion in a sprinkler head, having a first bore formed therein with a shoulder formed in said bore at one end thereof and at least one second bore formed therein in a direction generally transverse to said first bore and in contact with said first bore at the end wherein said shoulder is formed;

a piston having a central post with a radially extending plate fixed to one end of said post and at least one transverse slot formed in the other end of said post, said post having a portion positioned within said first bore and of sufficient length so that said at least one slot may be aligned with said at least one second bore;

a resilient member fixed to said plate, said resilient member being engageable with a periphery of said opening;

a spring of sufficient compressive resistance to counteract the pressure of said water flowing through said fire-sprinkler head, positioned so that one end thereof rests against said shoulder and the other end thereof rests against said plate, said spring being of sufficient length so that when



extended said resilient member is forced against said opening in the fire sprinkler head stopping the flow of water therefrom; and

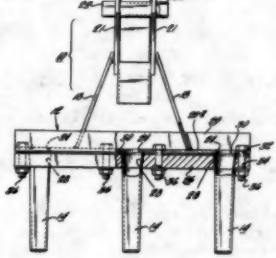
a retaining pin capable of insertion in said at least one second bore and capable of engaging said at least one slot so that when said pin engages said at least one slot said spring is compressed and said piston is held motionless relative to said body member whereby transverse movement of said pin out of said at least one slot releases said piston, such that said apparatus is retained between the opening in the fire-sprinkler head and the support frame.

4,638,867

TINE HOLDER FOR TURF AERATING APPARATUS

Loren F. Hansen, and Mark E. Lamb, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 16, 1985, Ser. No. 691,847
Int. Cl.[4] A01B *45/02*; B60B *27/06*
U.S. Cl. 172—22 **9 Claims**



1. A mounting arrangement for securing one end of a hollow turf aerating tine to a tine supporting member, said mounting arrangement comprising an outwardly tapered portion of said tine at the secured end thereof tapered to provide a maximum tine width at said tine end, an aperture in said tine supporting

member, a tine holding bar disposed in spaced relation to said tine supporting member, a tapered aperture in said tine holding bar having substantially the same taper as said tapered tine end portion for cooperatively receiving said tine end portion, the end of said tapered tine end portion protruding beyond said bar into engagment with said tine supporting member upon seating of said end portion in said aperture, and demountable attachment means for biasing said tine holding bar toward said tine supporting member and thereby clamping said protruding tine end against said tine supporting member in alignment with said aperture, said tine being additionally tapered from its tapered end portion to its free end with the smallest diameter thereof being at its free end, said additional taper being a more gradual taper than said end portion taper.

4,638,868

EARTH ENGAGING IMPLEMENTS

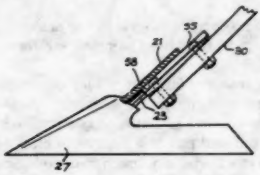
William M. Johnson, Winchlesea, and Ilmar Mere, St. Marys, both of Australia, assignors to Ralph McKay Limited, Maidstone, Australia

Filed Mar. 27, 1985, Ser. No. 716,624

Claims priority, application Australia, Mar. 30, 1984, PG4343

Int. Cl.[4] A01B *23/02*

U.S. Cl. 172—762 **4 Claims**



1. An earth engaging implement and tine construction comprising a tine having bolted thereto an adaptor having an upper surface externally tapered in cross section, and an elongated slot extending through said adaptor adapted to receive a bolt head and the lower surface of the adaptor comprises a central flat portion and two radiused portions at either end of said central portion, and an earth engaging implement comprising an earth engaging portion and an attachment portion, said attachment portion comprising a tapered socket of complementary cross sectional shape to said upper surface of said adaptor, said earth engaging implement being secured to said adaptor by a wedging frictional grip on to said upper surface, said adaptor being further characterized in that the angle of inclination of the upper surface of the adaptor when mounted on the tine corresponds to the angle of the attachment portion of the earth engaging implement when it is oriented for ground engagement.

4,638,869

BULLDOZER BLADE MOUNTING AND STABILIZING ARRANGEMENT

Michael J. Murphy, Peoria, and Kent D. Smith, Mapleton, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

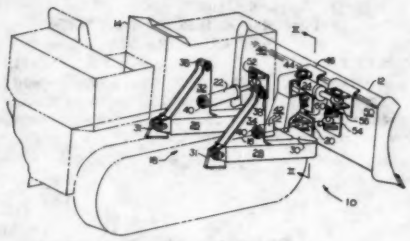
Filed Apr. 14, 1986, Ser. No. 851,847

Int. Cl.[4] E02F *3/76*

U.S. Cl. 172—821 **12 Claims**

1. In a mounting arrangement adapted for supporting and stabilizing a bulldozer blade on a vehicle, said mounting arrangement having a longitudinal axis and said bulldozer blade having a rear central portion, rear side portions and being adapted to angle and tilt relative to the longitudinal axis of said mounting arrangement, said mounting arrangement also including a mounting frame having side members each with one end adapted for pivotable connection to the vehicle and extending longitudinally therefrom, and an intermediate member interconnecting the other end of each of the side members; a universal joint connection interconnecting the rear central portion of the blade with the intermediate member of the mounting frame, said universal joint connection defining a center of motion with said longitudinal axis of the vehicle passing through said center of motion; a pair of hydraulic angling cylinders pivotably connected between the mounting frame and the respective rear side portions of the bulldozer blade; and a hydraulic tilt cylinder pivotably connected between the intermediate member of the mounting frame and one of the rear side portions of the bulldozer blade and in vertically spaced relation to said universal joint connection, the improvement comprising:

a bracket apparatus connected between the intermediate member of the mounting frame and the rear central portion of the bulldozer blade, said bracket apparatus being vertically spaced from the universal joint connection and



having a first bracket assembly secured to one of said intermediate member of the mounting frame and said rear central portion of the bulldozer blade, said first bracket assembly defining a generally transverse slot therein relative to said longitudinal axis, said slot defining a center substantially vertically aligned with the center of motion of the universal joint connection; and a second bracket assembly secured to the other of the intermediate member of the mounting frame and the rear central portion of the bulldozer blade, said second bracket assembly having a pin assembly attached thereto and disposed in the slot of the first bracket assembly substantially coaxially with the center of said slot when the bulldozer blade is in its non-tilted position, said pin assembly being freely movable in said slot to allow normal pitching of the bulldozer blade when said bulldozer blade is being tilted.

4,638,870

MOTOR DRIVEN HAND-HELD DEVICE CONTAINING A DISPLACEMENT MASS

Heinz Kousek, Feldkirch-Tisis, Australia, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 11, 1984, Ser. No. 680,390

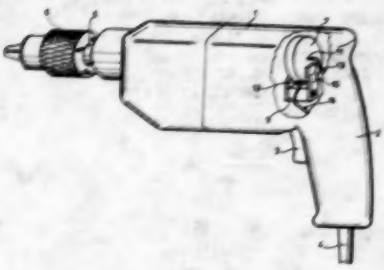
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346215

Int. Cl.[4] B23Q *5/00*

U.S. Cl. 173—12 **7 Claims**

1. Motor driven hand-held device for imparting rotary movement to a tool inserted into said device, comprising a housing having a rotational axis, a mass located within said housing, a sealed container located within said housing and formed of a non-electrically conductive material, said container comprises a hollow cylinder with the cylindrical axis diposed in parallel relation with the rotational axis of said housing, said cylinder is rigidly secured to said housing, said mass located within said container and comprising an electrically conductive liquid, said container arranged in said housing so that said mass is movable relative to said container in a direction extending perpendicularly of the rotational axis, means within said housing for forming a magnetic field with said electrically conductive liquid at least partially traversing

said magnetic field, and means for tapping voltage induced in said electrically conductive liquid by the relative movement of



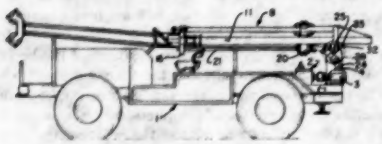
said electrically conductive liquid with respect to the magnetic field.

4,638,871

EARTH DRILL RIG

Charles L. Rassieur, St. Louis, Mo., assignor to Central Mine Equipment Company, St. St. Louis, Mo.

Filed Feb. 21, 1985, Ser. No. 704,074
Int. Cl.[4] E21B 15/04
U.S. Cl. 173—26 3 Claims



1. In an earth drill rig wherein an upwardly and downwardly moving drill-string-turning rotary table is rotated by a kelly bar connected at its lower end to a vertical drive shaft, said kelly bar being journalled for rotation in and fixed against axial movement with respect to a drill frame assembly and said rotary table being mounted for axial movement on and along said drill frame assembly, said drill frame assembly being pivotally mounted on a vehicle on a substantially horizontal axis for pivoting between an upright position and a substantially horizontal position for transportation, the improvement comprising said drill frame assembly pivot axis positioned below the lower end of the kelly bar and above the upper end of said vertical drive shaft, and a universal coupling connecting said lower end of said kelly bar and said vertical drive shaft said universal coupling comprising universal joints at opposite ends of an elongated slip joint connector and connected there-by for relative axial movement but driving coupling between said universal joints, said universal joints lying generally on a circle of which the drill frame assembly pivot axis is the center, whereby said drill frame assembly can be moved between said upright and said substantially horizontal positions without disconnecting said kelly bar from said vertical drive shaft, said kelly bar being revolvable by said drive shaft through substantially the entire range of movement of said drill frame assembly.

4,638,872

CORE MONITORING DEVICE

Arthur Park, Odessa, and Bob T. Wilson, Midland, both of Tex., assignors to Diamond Oil Well Drilling Company, Midland, Tex.

Filed Apr. 1, 1985, Ser. No. 718,543
Int. Cl.[4] E21B 25/00
U.S. Cl. 175—46 18 Claims

1. A well core drilling apparatus for retrieving a core from a bore hole, comprising:

coring means for boring the well core at the bottom of the bore hole;

container means associated with said coring means for containing the well core;

measurement means disposed in the upper end of said coring means for generating signal directed downwards toward the core and receiving the energy of said signals reflected from the core and calculating the distance of the core from said measurement means;

said measurement means calculating time versus distance for storage internal thereto and comparing said distance versus time measurement with a predetermined value;

means for generating a fault signal when said distance versus time calculation is less than its predetermined value indicating that the core is not progressing up into said container means at a rate defined by said predetermined value; and

means for indicating to the surface that said fault signal has been generated.

17. A method for measuring the rate at which a well core proceeds up into the inner barrel of a well coring device, comprising:

providing an inner barrel;

generating an ultrasonic signal at the upper end of the inner barrel in the well coring device;

detecting the energy that reflects from the core and travels upward to the upper end of the inner barrel;

measuring the time interval between generation of the ultrasonic signal and reception of the reflected energy from the core and calculating distance;

storing said calculated distance;

calculating the difference between two successive distance measurements;

comparing said calculated difference with a predetermined value and generating a fault signal if said calculated difference is less than a predetermined value; and

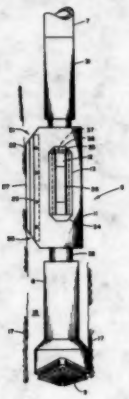
providing an indication to the surface of the generation of said fault signal.

4,638,873

DIRECTION AND ANGLE MAINTENANCE TOOL AND METHOD FOR ADJUSTING AND MAINTAINING THE ANGLE OF DEVIATION OF A DIRECTIONALLY DRILLED BOREHOLE

Austin E. Welborn, Rte. 1, Box 96A, Greensburg, La. 70441

Filed May 23, 1984, Ser. No. 613,360
Int. Cl.[4] E21B 7/04, 7/08
U.S. Cl. 175—73 15 Claims



1. A direction and angle maintenance tool for drilling directionally oriented boreholes, comprising:

(a) a mandrel having a longintudinal bore, an upper end attachable to a rotary drill pipe, a lower end attachable to a rotary drill bit sub and a reduced diameter section;

(b) a sleeve, rotatably attachable around said reduced diameter section of said mandrel, said sleeve having an eccentric longitudinal bore forming a weighted side, and a gauge insert which is longitudinally and fixedly attached to said weighted side said longitudinal bore being of sufficient diameter to allow free relative rotation between said mandrel and said sleeve; and

(c) a means, attachable to said sleeve and said insert, for longitudinally and fixedly attaching said gauge insert to said sleeve on said weighted side.

15. A method for adjusting and maintaining the angle of deviation of a directionally drilled borehole, comprising the steps of:

(a) attaching between a drill string and a drill bit a direction and angle maintenance tool comprising:

(i) a mandrel having a longintudinal bore, an upper end attachable to a rotary drill pips, a lower end attachable to a rotary drill bit sub and a reduced diameter section; and

(ii) a sleeve, rotatably attachable around said reduced diameter section of said mandrel, said sleeve having an eccentric longitudinal bore forming a weighted side, and a gauge insert which is longitudinally and fixedly attachable to said weighted side, said longitudinal bore being of sufficient diameter to allow free relative rotation between said mandrel and said sleeve,

(b) attaching to said sleeve on said weighted side said gauge insert of a particular thickness so as to achieve a desired deviation from vertical;

(c) lowering said drill string, said tool and said bit into said borehole; and

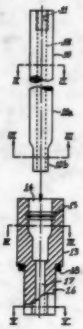
(d) rotating said drillstring relative to said tool and drilling to a desired depth at said desired deviation from vertical.

4,638,874

DRILL ADAPTOR

Stephen G. Dawe, Middelburg, and James A. Brews, Springs, both of South Africa, assignors to Coalequip (Proprietary) Limited, Transvaal, South Africa

Filed Jul. 26, 1983, Ser. No. 517,365
Claims priority, application South Africa, Jul. 26, 1982, 82/5334; Nov. 26, 1982, 82/8725
Int. Cl.[4] E21B 17/00
U.S. Cl. 175—321 3 Claims



1. An adaptor for coupling a circular drill rod to a polygonal drive socket forming part of a drilling machine, comprising a body member having a tail portion, said tail portion being receivable in the polygonal socket in spigot and socket arrangement, and being of a mating polygonal profile, the body member further having a leading portion which defines an axial recess adapted to receive a trailing end of the drill rod, the trailing end of the drill rod defining a first locking formation, and the axial recess defining a second corresponding locking formation, with inter-connection between the locking formations preventing relative rotation between the drill rod and the body, a fluid passage passing through the body member and having an inlet thereto in the zone of the polygonal tail, and an outlet therefrom in the axial recess, the body member further defining an external peripheral collar adjacent the tail, and a resilient buffer ring on the tail adjacent the collar, the collar and buffer ring forming an abutment against which the polygonal socket sealingly engages so that the fluid passage is sealed relative to the interior of the polygonal socket, and sealing means provided within the axial recess of the body to form a fluid-type seal between the tailing end of the drill rod and the outlet of the fluid passage, so that fluid can be passed from the polygonal socket along the fluid passage in the body and along an axial passage provided in the drill rod, complementary locking formations are provided on the drill rod and within the axial recess, in the form of tongue and groove formations.

4,638,875

BLENDING SYSTEM WEIGHING UNIT

William R. Murray, Gastonia, N.C., assignor to Fiber Controls Corp., Gastonia, N.C.

Filed Dec. 24, 1984, Ser. No. 685,482
Int. Cl.[4] G01G 19/00, 19/52, 23/18, 19/22
U.S. Cl. 177—1 43 Claims

1. Fiber weighing apparatus comprising:

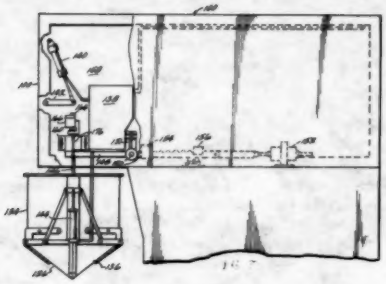
a pan;

means for filling said pan with fibers;

means for emptying said pan when the weight of fibers in said pan exceeds a predetermined value;

means for generating an excessive fill time signal when a first

predetermined time occurs from the beginning of filling without said pan being emptied; and



means for maintaining said excessive fill time signal until said filling means and emptying means are deactivated.

4,638,876

WEIGHING APPARATUS

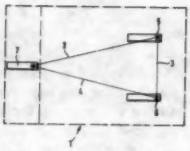
Franz Balduin, Eilendorferstr. 145, 5100 Aachen, Fed. Rep. of Germany, and Ernst Adenauer, Aachen, Fed. Rep. of Germany, assignors to Franz Balduin, Aachen, Fed. Rep. of Germany

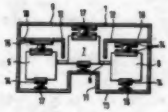
Filed Oct. 3, 1985, Ser. No. 783,760

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 8429287[U]; Aug. 3, 1985, 8522425[U]

Int. Cl.[4] G01G *19/08*

U.S. Cl. 177—139 **3 Claims**





1. A weighing apparatus having at least three weight measuring systems which input a computing device for use with a forklift, said forklift having two parallel supporting struts extending from a crosspiece therebetween with rollers supported at the ends of the struts, steering head arranged at the front end of the forklift, an undercarriage for the forklift, coupling bar arranged in said struts and operatively interconnecting the steering head and the rollers, said weighing apparatus comprising:

a weighing plate forming the loading surface of the forklift;

said undercarriage supporting a weight measuring system disposed on the center axis of the forklift behind said steering head and at least one weight measuring system disposed on the center axis of each supporting strut in front of the rollers supported thereby, each said weight measuring system being disposed between said undercarriage and said weighing plate and a ball bearing supported between each said undercarriage and weighing plate and the associated weight measuring system with a slight clearance; and

each coupling bar including at least in the zone of the weight measuring system supported by the respective strut, two rails disposed around said respective weight measuring system with a spacing between said respective coupling bar and said respective weight measuring system.

4,638,877

STEERING AXLE ARRANGEMENT FOR A WHEEL BODY OF A VEHICLE

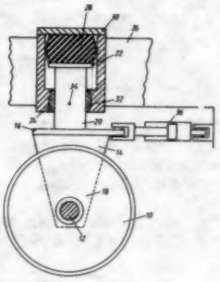
Hans Baumers, Dusseldorf; Heinz Lietzke, Neuss, and Winfred Schulte, Ratigen, all of Fed. Rep. of Germany, assignors to Losenhausen Maschinenbau AG & Co. Kommanditgesellschaft, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 588,003

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312175

Int. Cl.[4] B62D *61/00, 5/02*

U.S. Cl. 180—21 **8 Claims**



1. In a steering axle assembly for a wheel body of a vehicle which has a vehicle frame, said steering axle assembly including:

(a) a steering frame in which the wheel body is mounted;

(b) a steering axle rigidly connected with a steering frame;

(c) bearing means for the steering axle; and

(d) an elastomeric supporting element between the vehicle frame and the steering axle; the improvement which comprises:

(e) said bearing means comprising a guide bushing which is connected with the vehicle frame and in which the steering axle is axially slidingly guided, said guide bushing being supported on the vehicle frame in a manner permitting pendulous motion of the steering axle, steering frame and wheel body relative to the vehicle frame;

(f) said elastomeric supporting element being arranged coaxially with respect to the steering axle; and

(g) said elastomeric supporting element, on one side, being non-rotatably connected with the steering axle.

4,638,878

DEVICE FOR THE CUSHIONED MOUNTING OF A TRACTOR CAB

Hermann-Josef Komp, Bad Münstereifel Im Kronenberg, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,103

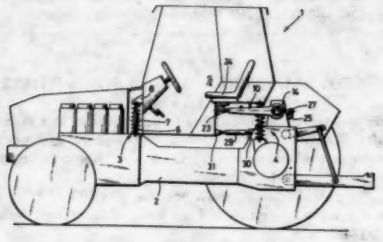
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1984, 3436169

Int. Cl.[4] B62D *33/06*

U.S. Cl. 180—89.13 **8 Claims**

1. A vehicle comprising a chassis and a cab having a front and a rear mounted thereon, three spring action cushioning mounting points between the cab and the chassis, at least one

point being of the long stroke type, one mounting point being near the front of the cab and the other two near the rear and opposed to each other on a line transverse to the longitudinal axis of the chassis, an approximately triangular transversal



swinging arm pivotally attached at one end to two points on an axle secured to the chassis, the axle located near the rear of the cab and extending transverse to the longitudinal axis of the chassis, the swinging arm attached to the cab at the other end by a ball joint located near the center of gravity of the cab.

4,638,879

DEVICE FOR REGULATING THE SPEED OF A VEHICLE, PARTICULARLY AN AUTOMOTIVE VEHICLE, HAVING AN ELECTRONIC REGULATOR

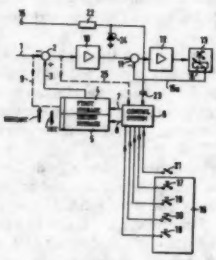
Harald Collonia, Glasshütten, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,606

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405707

Int. Cl.[4] B60K *31/04*

U.S. Cl. 180—179 **4 Claims**



3. In a device for regulating the speed of a vehicle and particularly of an automotive vehicle having an electronic regulator; and wherein said regulator comprises a first storage for storing a speed desired-value signal and a control system for operating the storage; said regulator including means for comparing a speed actual-value signal with the speed desired-value signal to produce a corresponding setting signal; and said control system having an operating device which is connected to the regulator and has at least one button for setting the storage to the speed desired-value signal, one button for disconnecting regulation of the regulator, the improvement comprising

means in the regulator including a second storage for storing a second speed desired-value signal, said second storage being connected with the first storage in a stack which is controllable by the control system, and

means for storing the same present speed desired-value signal in the first storage and in the second storage upon the first actuation of the setting button after energization of the ignition.

4,638,880

SIDE STAND OF A MOTORCYCLE

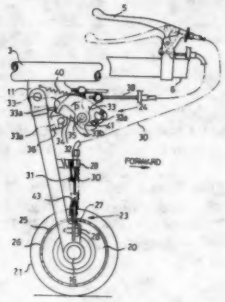
Toshio Togashi, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed May 21, 1985, Ser. No. 736,350

Claims priority, application Japan, May 21, 1984, 59-103009

Int. Cl.[4] B62H *1/02*

U.S. Cl. 180—219 **8 Claims**



1. A means for supporting a motorcycle comprising:

a manually operable clutch lever movably mounted on a handle of the motorcycle and adapted to be placed either in a first position or in a second position;

a side stand pivotally mounted on a frame element of the motorcycle and adapted to be located in a stored location adjacent to the frame element when said clutch lever is in said first position and in a deployed location for supporting the motorcycle when said clutch lever is in said second position;

side stand moving means connecting said side stand to said clutch lever for moving said side stand from said stored location to said deployed location when said clutch lever is moved from said first position into said second position;

an auxiliary wheel rotatably mounted on said side stand;

wheel locking means on said side stand for locking said auxiliary wheel against rotation, said wheel locking means being adapted to be located in a locking position in which rotation of said auxiliary wheel is prevented when said clutch lever is in said first position and in a freeing position in which said auxiliary wheel is free to rotate when said clutch lever is in said second position;

wheel locking means moving means connecting said wheel locking means to said clutch lever for moving said wheel locking means from said locking position to said freeing position when said clutch lever is moved from said first position into said second position;

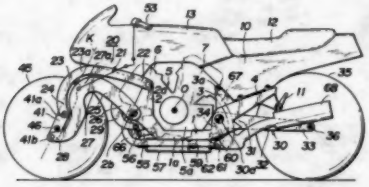
both said side stand moving means and said wheel locking means moving means being connected to said clutch lever to be operated simultaneously so that said auxiliary wheel is freed to rotate simultaneously with the deployment of said side stand into said deployed location and said auxiliary wheel is locked against rotation when said side stand is moved into said stored location.

4,638,881

MOTORCYCLE, AND BODY STRUCTURE THEREFOR

Minoru Morioka, Saitama; Toshiaki Kishi, Tokyo, and Toshiharu Yoshioka, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,058
Claims priority, application Japan, Dec. 26, 1983, 58-249773
Int. Cl.[4] B62K *21/02, 25/20, 25/24*
U.S. Cl. 180—219 7 Claims



1. A body structure for a motorcycle with a front wheel and a rear wheel, comprising:

an engine;

a body frame assembly having said engine mounted thereon;

a front leading arm for supporting said front wheel;

said front leading arm being vertically swingably joined at a rear portion thereof to said body frame assembly, and said front leading arm being operatively vertically swingably joined at a front portion thereof to said front wheel;

said front leading arm including an intermediate, arcuate portion extending above a straight line passing through both said swingable joints, and said arcuate portion being upwardly curved in the direction of a steering axis of said front wheel when viewed from a side of said motorcycle;

a first shock absorber operatively connected to said front leading arm;

a steering mechanism for steering said front wheel;

said steering mechanism including a handlebar;

a rear trailing arm for supporting said rear wheel;

said rear trailing arm being vertically swingably joined in a front portion thereof to said body frame assembly; and

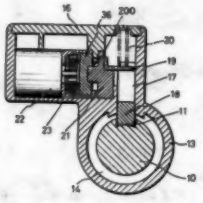
a second shock absorber operatively connected to said rear trailing arm.

4,638,882

KEYLESS STEERING SHAFT LOCK ARRANGEMENT

Hidekazu Sato, Kasukabe, Japan, assignor to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,134
Int. Cl.[4] B60R *25/02*
U.S. Cl. 180—287 5 Claims



1. A keyless, motor-driven, steering shaft-locking and unlocking arrangement, said arrangement comprising:

a frame,

an electric motor,

a reduction gear connected with said motor,

an output shaft wheel connected to said reduction gear at an output side of said output shaft wheel,

a rotator coupled with said output shaft wheel and acting as a rotary cam,

said motor, said gear, said output shaft wheel and said rotator being arranged in line in said frame,

a spring-loaded hanger slidable within said frame and position-controlled by said rotator,

a shaft-locking and unlocking bar connected with said hanger and mounted slidably in the frame and engageable with a vehicle steering shaft, said bar being shiftable between a first position for unlocking of the vehicle steering shaft and a second position for locking the vehicle steering shaft, and

control circuit means for controlling the turning on and off of said motor, said control circuit means including

a sensor for sensing a vehicle-running condition and a vehicle-stationary condition and for delivering different signals for said two vehicle conditions,

a starter circuit connected with said sensor, said starter circuit being responsive to a signal from said sensor indicative of said vehicle-running condition to prevent said bar from moving to said second position, and

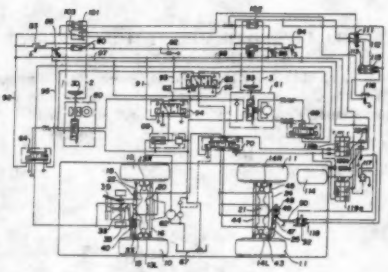
a locking circuit connected with said sensor, said electric motor being rotatable until driving said bar to said second position upon receipt of an output signal from said locking circuit based upon a signal received from said sensor indicative said vehicle-stationary condition.

4,638,883

STEERING SYSTEM FOR AUTOMOTIVE VEHICLE

Ryoji Morlizumi; Yoichi Suzuki, and Kazuhiro Ameda, all of Ageo, Japan, assignors to Nissan Diesel Co., Ltd., Saitama, Japan

Filed Jun. 24, 1985, Ser. No. 748,019
Claims priority, application Japan, Jun. 29, 1984, 59-97998[U]; Sep. 25, 1984, 59-143500[U]
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—324 8 Claims



1. A steering system for hydraulically steering the front wheels only or both of the front wheels and rear wheels of an automotive vehicle responsive to manipulation of any one of a plurality of steering wheels which respectively are accessible from a first seat positioned in a front portion of the vehicle and a second seat positioned in a rear portion of the vehicle, the first seat being adapted to drive the vehicle and the second seat to manipulate a crane or the like which is mounted on the vehicle, said steering system comprising:

power cylinders for changing orientation of the front wheels and power cylinders for changing orientation of the rear wheels;

directional control valves associated respectively with the first seat and the second seat for selectively communicating hydraulic fluid under pressure from a source of power to said power cylinders each responsive to the direction of

rotation of the steering wheel associated with the directional control valves;

a first solenoid-operated valve for selectively distributing the fluid under pressure from the source to said directional control valves;

second and third solenoid-operated valves included in a hydraulic circuit between the directional control valves and the power cylinders for selectively connecting the directional control valves and the power cylinders;

a power source circuit for applying a switching current to said first to third solenoid-operated valves via a key switch which is associated with the first seat;

a power source circuit for applying a switching current to the first to third solenoid-operated control valves via a key switch which is associated with the second seat;

a relay for cutting off said power source circuit associated with the second seat when the key switch associated with the first seat is turned on;

a relay for cutting off said power source circuit associated with the first seat when the key switch associated with the second seat is turned on; and

a solenoid-operated directional control valve;

hydraulic circuit means connecting said power cylinders, said directional control valves, said first, second, and third solenoid-operated valves and said solenoid-operated directional control valve;

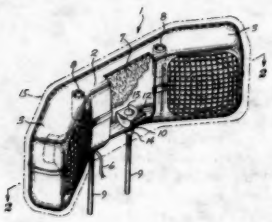
said solenoid-operated directional control valve selectively establishing and interrupting said hydraulic circuit means between the power cylinders associated with the front wheels and the power cylinders associated with the rear wheels.

4,638,884

CHAMBERED HEADREST MOUNTING FOR STEREOPHONIC LOUDSPEAKERS

James Lee, 2115 Mission, Spokane, Wash. 99201, assignor to Willis S. Cole, Seattle; James Lee, Vancouver; Rob Wortman and Claude Frabel, both of Lynnwood, all of, Wash.

Filed Jul. 11, 1985, Ser. No. 754,496
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—141 **10 Claims**



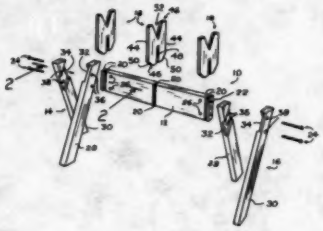
1. A headrest comprising a casing including a hollow central bridging portion and hollow end portions connected by said central bridging portion, stereophonic loudspeakers for different channels housed in said hollow end portions, respectively, said hollow end portions being in communication acoustically through said hollow central bridging portion, and vent means venting said casing hollow end portions to the exterior of said casing.

4,638,885

COMBINATION SAWHORSE AND SAWBUCK

Raymond L. Frederick, 7425 NW. Anderson Hill Rd., Silverdale, Wash. 98383

Filed Dec. 6, 1984, Ser. No. 678,774
Int. Cl.[4] B27B *21/00*; B25B *1/20*
U.S. Cl. 182—151 **14 Claims**



1. A combination sawhorse and sawbuck comprising:

a first leg assembly;

a second leg assembly which is substantially identical to said first leg assembly;

a horizontal member having first and second opposed ends and first and second opposed sides, said first end attached to said first leg assembly and said second end attached to said second leg assembly, said first side having a first vertical surface groove and said second side having a second vertical surface groove; and

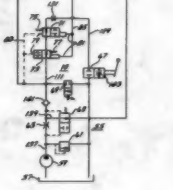
at least one removable member provided with a slot at a lower end thereof which is adapted to simultaneously engage said first and said second vertical surface grooves of said horizontal member, each removable member having a V shaped recess at an upper end thereof receptive to a work piece.

4,638,886

APPARATUS FOR DISABLING AN OBSTRUCTED LIFT MECHANISM

Walter E. Marietta, Racine, Wis., assignor to Sta-Rite Industries, Inc., Milwaukee, Wis.

Filed Oct. 21, 1985, Ser. No. 789,516
Int. Cl.[4] B66F *7/16*; F15B *13/07*
U.S. Cl. 187—8.49 **9 Claims**



1. An apparatus for disabling an obstructed lift mechanism having at least two hydraulic cylinders employed for controllably lifting and lowering a load, said apparatus including:

a first valve for sensing the differential pressure between a first sensing line and a second sensing line;

a second valve for sensing said differential pressure between said first sensing line and said second sensing line;

said first valve being movable to a position for preventing

the flow of hydraulic fluid from a first cylinder when the pressure in said second sensing line exceeds the pressure in said first sensing line by a first predetermined value;

said second valve being movable to a position for preventing the flow of hydraulic fluid from said first cylinder when the pressure in said first sensing line exceeds the pressure in said second sensing line by a second predetermined value.

4,638,887

ELEVATING APPARATUS

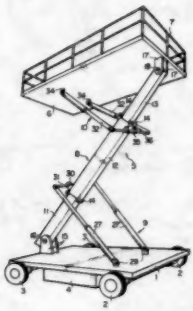
Mitsuhiro Kishi, Ashikaga, Japan, assignor to Kabushiki Kaisha Hikoma Seisakusho, Tochigi, Japan

Filed Apr. 30, 1985, Ser. No. 728,838

Claims priority, application Japan, May 1, 1984, 59-88150; May 14, 1984, 59-95797; Jun. 4, 1984, 59-115239; Jun. 4, 1984, 59-115240; Apr. 8, 1985, 60-74044

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—9 R **16 Claims**



1. An elevating apparatus comprising:

(a) a base;

(b) a platform:

(c) a telescopic boom assembly connecting said base and said platform together, said telescopic boom assembly being composed of a lower outer boom pivotally coupled to said base, an upper outer boom pivotally coupled to said platform, and a middle boom slidably receiving said lower outer boom and slidably movable in and out of said upper outer boom, and an upper boom inserted in and fixed to said upper outer boom;

(d) at least one first hydraulic cylinder disposed in said telescopic boom assembly for extending and contracting said telescopic boom assembly;

(e) at least one second hydraulic cylinder operatively coupled between said telescopic boom assembly and said base for tilting said telescopic boom assembly with respect to said base; and

(f) at least one third hydraulic cylinder operatively coupled between said telescopic boom assembly and said platform for keeping said platform substantially parallel to said base.

4,638,888

HYDRAULIC ELEVATOR

Jeffrey A. Coy, Lincoln, Nebr., assignor to Brownie Manufacturing Co., Inc., Waverly, Nebr.

Filed Mar. 18, 1985, Ser. No. 712,766

Int. Cl.[4] B66B *1/04, 5/16*

U.S. Cl. 187—19 **11 Claims**

1. A hydraulic elevator comprising, in combination:

a guide rail mast;

an elevator car mounted on said guide rail mast;

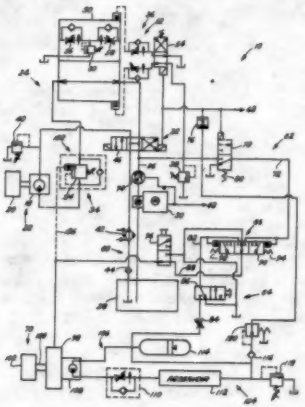
primary hydraulic control means for providing a regulated hydraulic flow having a direction and a rate, said primary hydraulic control means having a line pressure;

primary motor means, interconnected to said primary hydraulic control means and responsive to said regulated hydraulic flow, for bidirectionally driving said elevator car along said guide rail mast, said primary motor means including a hydraulic motor and motor gear means for interconnecting said hydraulic motor and said guide rail mast;

control means for monitoring said regulated hydraulic flow and for providing a primary brake release pressure supply under predetermined conditions within said primary hydraulic control means;

manually-activated emergency descent means for providing an emergency brake release pressure supply;

brake means, responsive to said primary brake release pressure supply and said emergency brake release pressure



supply, for selectively locking and releasing said elevator car in relation to said guide rail mast, said brake means including a hydraulic brake and brake gear means for interconnecting said hydraulic brake and said guide rail mast;

emergency stop means for overriding said control means and said manually-activated emergency descent means so as to activate said hydraulic brake and positionally lock said elevator car; and

hydraulic safety-governor means for monitoring and controlling said elevator car during descent thereof, said hydraulic safety-governor means including a hydrulic circuit mechanically coupled to said brake means;

said manually-activated emergency descent means being in fluid communication with said hydraulic circuit so as to draw said emergency brake release pressure supply therefrom.

4,638,889

ELEVATOR SYSTEM

Richard H. Ludwig, West Caldwell, N.J., and Joanne E. Mikhail, Herndon, Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1985, Ser. No. 742,835

Int. Cl.[4] B66B *1/22*

U.S. Cl. 187—29 R **8 Claims**

1. A method of providing special service for a hall call registered for a predetermined period of time in an elevator system having a plurality of elevator cars mounted in a building to serve the floors therein, comprising the steps of:

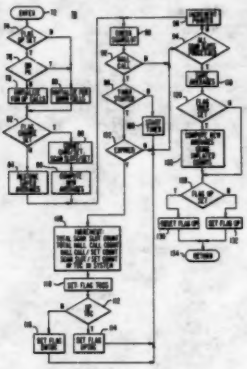
providing an actual call per car average responsive to the

number of registered hall calls and the number of cars enabled to serve them,

providing a prospective call per car average responsive to the number of possible hall calls and the number of cars enabled to serve them,

assigning the floors and service directions therefrom to the elevator cars responsive to said actual and prospective hall call per averages,

timing the duration of at least certain of the hall calls,



indicating that a hall call has timed-out when it has been registered for a predetermined period of time,

selecting an elevator car from all of the elevator cars suitably conditioned to serve a timed-out call responsive to their relative work loads.

and assigning the floor and service direction associated with a timed-out call to the car selected in the selecting step, while maintaining the prior assignment of the same floor and service direction previously made to another elevator car.

4,638,890

BRAKE DEVICE FOR A CYCLE

Oskar E. Lohman, Nacka, Sweden, assignor to AB Trama, Nacka, Sweden

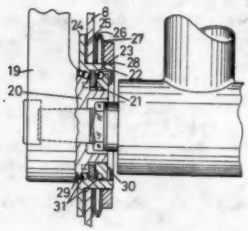
PCT No. PCT/SE83/00401, § 371 Date Jul. 13, 1984, § 102(e) Date Jul. 13, 1984, PCT Pub. No. WO84/01924, PCT Pub. Date May 24, 1984

PCT Filed Nov. 15, 1983, Ser. No. 631,434

Claims priority, application Sweden, Nov. 15, 1982, 8206473

Int. Cl.[4] B62L *5/00;* **F16D** *63/00*

U.S. Cl. 188—24.17 **9 Claims**



1. A system for braking at least one wheel of a cycle, comprising:

brakes which are operable to brake the rotational movement of the wheel,

actuating means for operating the brakes, said actuating means including a brake actuating member which is operatively connected to the brakes and is movable from an inactive position to an active position where it actuates the brakes of the cycle,

a pedal crank assembly which is rotatable in a forward direction to drive the cycle and is rotatable in a reverse direction to move the brake actuating member to its active position to actuate the brakes,

a freewheel means which connects the pedal crank assembly to the brake actuating member, said freewheel means being disengaged when the pedal crank assembly is driven in a forward direction and being engaged when the pedal crank assembly is driven in a reverse direction to move the brake actuating member to its active position,

a slip coupling means connected to the freewheel means and, together with said freewheel means, connecting the pedal crank assembly to the brake actuating member, said slip coupling means being operable when the pedal crank assembly is forced in a rearward direction to reduce the force transmitted from the pedal crank assembly to the brake actuating member during heavy braking.

4,638,891

SHAFT BRAKING DISC FOR RAIL VEHICLE DISC BRAKE

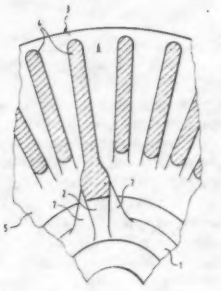
Xaver Wirth, Ismaning, Fed. Rep. of Germany, assignor to Knorr-Bremse AG, Munich, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,924

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432374

Int. Cl.[4] B61H *13/00;* **F16D** *65/12, 65/847;* **B21H** *5/00*

U.S. Cl. 188—58 **1 Claim**



1. Shaft braking disc for a rail vehicle disc brake having a unitary friction ring (3) with an annular body (5) on each of its sides and radial cooling air channels (6) therebetween, said channels being limited by ventilation ribs (4) unitary with said annular bodies and extending radially in the direction of the circumference, at least some of said ventilation ribs, uniformly spaced along said circumference, being extended radially inwardly as support spokes (2) and being connected with a hub (1) seated on a shaft to be braked, said support spokes having a width, in the axial direction, which diminishes smoothly from said friction ring (3) radially inwardly to said hub, said support spokes being provided on both sides in the circumferential direction with reinforcement ribs (7) applied to a radially outer end of said support spokes and having a width which increases radially inwardly, said reinforcement ribs terminating radially inwardly in said hub (1), the sum of the cross sectional areas of said support spokes (2) and said reinforcement ribs (7) being at least substantially constant over the entire radial length of said support spokes.

4,638,892

LINK JOINT BETWEEN A BRAKE CYLINDER AND A BRAKE LINKAGE

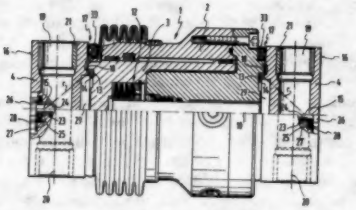
Xaver Wirth, Ismaning, Fed. Rep. of Germany, assignor to Knorr-Bremse AG, Munich, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 810,485

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3447747

Int. Cl.[4] F16D *55/224, 65/28*

U.S. Cl. 188—59 9 Claims



1. Link joint between a brake cylinder and a brake linkage with brake levers (6), especially for a brake cylinder (1) arranged between the brake levers (6) of a braking pincers for rail vehicle disc brakes, comprising a bearing lug (4), pivotally mounted on a brake cylinder part by means of a turning surface bearing (14, 18) symmetrical to a brake cylinder axis (10), a brake linkage part being coupled to said bearing lug (4) in a manner which permits rotation about a crossbolt (5), wherein said turning surface bearing (14, 18) has bearing surfaces (14, 18) which are narrow with relation to its diameter, which annularly surround said brake cylinder axis (10) and which are situated in a transition area (17) of the bearing lug (4) to said brake cylinder part, wherein said turning surface bearing (14, 18) is constructed as a pre-stressed thrust bearing, wherein the rotational center (15) of said turning surface bearing (14, 18) is located at least adjacent to a contact point (27) of at least one screw joint of said bearing lug (4), said contact point (27) is flexibly pre-stressed in a pressure direction located in the region of a surface (16) of said bearing lug (4) facing away from aid brake cylinder, and the screw joint is held, after passing through said bearing lug (4) with lateral play, on the other side, on said brake cylinder part (2, 3).

4,638,893

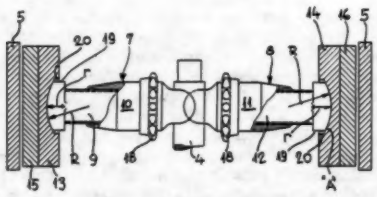
MEANS FOR TRANSMITTING BRAKE FORCE

Sven E. Camph, Flygarevägen 9F, S-236 00 Höllviksnäs, Sweden

Filed Nov. 20, 1984, Ser. No. 673,349

Int. Cl.[4] F16D *65/56*

U.S. Cl. 188—79.5 GE 1 Claim



1. A braking system having a brake activating key and a brake shoe in a drum brake comprising a pair of variable length force transmitting elements one end of each of which engages the activating key and is actuated thereby, the other end of each force transmitting element having a convex cylindrical contact surface, said brake shoe (14) having a concave cylindrical contact surface of greater area of contact than the curved surface of said convex cylindrical surface, said convex and concave surfaces being complemental between said force transmitting elements and said brake shoe, means comprising the concave surface of greater area than the convex surface being shaped for mating in relative sliding contact with the convex surface in a limited direction which prevents relative sliding movement in the axial direction of the drum brake, the radius of said cylindrical curved surfaces of said force transmitting elements and the brake shoe being greater than the length of said force transmitting elements and lying in a plane containing the axis of the brake drum making the mating contact surface of the convex element engage the brake shoe cylindrical surface over an arc having a radius L.

4,638,894

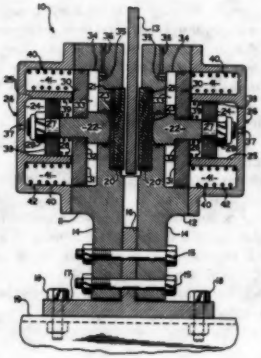
CALIPER DISC BRAKE ASSEMBLY

Mansur N. Sitabkhan, North Royalton, and Raymond E. Mack, Rocky River, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed May 30, 1985, Ser. No. 739,343

Int. Cl.[4] F16D *65/24*

U.S. Cl. 188—170 13 Claims



1. A caliper disc brake having a rotor disc and a pair of friction means disposed on opposite sides of the rotor disc comprising;

a pair of housing members supporting said friction means including means for mounting said friction means adjacent to and on opposing sides of said rotor disc, a bore in at least one of said housing members;

a force transmitting member slidably mounted in said bore, having means at one end which coacts with said friction members to move same into contact with the rotor disc;

a first piston slidable in said bore and fixed to the force transmitting member at the end thereof opposite to said one end;

a first spring means normally biasing said first piston and the force transmitting member in a direction away from said friction members element;

a second piston disposed in said bore and slidably mounted on and intermediate the ends of said force transmitting member, an abutment means formed on said force transmitting member adjacent said second piston;

a second spring means normally biasing said second piston in a direction toward the friction members element and having a biasing force substantially greater than said first spring means to force said second piston against said abutment means to apply the brake;

means to apply fluid pressure to said second piston on the side opposite said second resilient means to compress said second spring means and release the brake, and;

means to apply a modulated fluid pressure to said first piston

on the side thereof opposite to said first spring means to thereby cause said force transmitting member to apply a modulated braking force to said friction members elements.

4,638,895

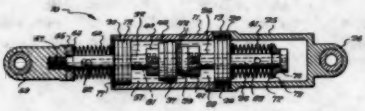
FRICTIONLESS HYDRAULIC DAMPER AND DAMPER-SNUBBER

Douglas P. Taylor, N. Tonawanda, N.Y., and David A. Lee, Santa Monica, Calif., assignors to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Jul. 5, 1985, Ser. No. 752,094

Int. Cl.[4] F16F *9/49*; F16M *13/00*

U.S. Cl. 188—280 **13 Claims**



12. A damper-snubber comprising a cylinder, end walls in said cylinder, a shaft, labyrinth seals in said end walls, portions of said shaft in said labyrinth seals, end portions of said shaft extending outwardly beyond said labyrinth seals, a bellows seal mounted in fluid-tight relationship between each of said end walls and its adjacent end portion of said shaft, fluid in said cylinder and in both of said bellows, a piston head on said shaft in said cylinder, orifice means located relative to said piston head to permit flow of fluid past said piston head when said piston head moves below a predetermined velocity to thereby cause said damper-snubber to function as a damper, conduit means effecting communication between both of said bellows seals, first means on said shaft for attachment to a first external object, second means on said cylinder for attachment to a second external object which is movable relative to said first external object, and valve means for selectively closing said orifice means when said piston head moves above said predetermined velocity to cause said damper-snubber to function as a snubber.

4,638,896

SHOCK ABSORBERS

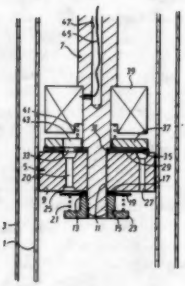
John Poyser, Haxby, England, assignor to Armstrong Patents Co. Ltd., North Humberside, United Kingdom

Filed May 3, 1985, Ser. No. 730,059

Claims priority, application United Kingdom, May 3, 1984, 8411319

Int. Cl.[4] B62K *25/06*; F16F *9/46*

U.S. Cl. 188—299 **3 Claims**



1. A twin tube telescopic shock absorber comprising a pair of coaxially aligned cylinders, one cylinder being located within the other, a foot valve assembly being located at one end region of the inner cylinder to control fluid flow between the inner cylinder and the annular cavity between the cylinders, and a piston being axially slidably arranged within the inner cylinder, an electromagnetically controlled valve being arranged to provide a fluid flow path bypassing the piston, the electromagnetically controlled valve being electrically connected to the outside of the shock absorber via an electrical connection which extends through a piston rod connected to the piston, and being closed when de-energised, the electromagnetically controlled valve comprising at least one bore extending axially through the piston, a flexible closure member of planar configuration, engaging against the rear face of the piston and having a restrictor aperture which is aligned with the bore, the flexible closure member being secured to said piston rear face at a point remote from said bore, a closure plate engaging over and being spring biased against said closure member to thus close the aperture and aligned bore, an electromagnet mounted on a piston rod connected to the rear face of the piston being capable, when energised, of lifting the closure plate off the closure member, to uncover the restrictor aperture in the closure member, allowing fluid to flow through the bore as the piston is moved axially within the cylinder.

4,638,897

DAMPER DEVICE FOR A TORQUE CONVERTER CLUTCH

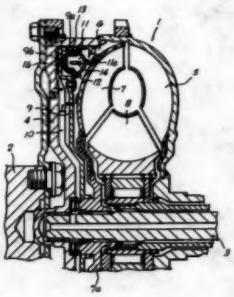
Sadanori Nishimura, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 505,753

Claims priority, application Japan, Jun. 24, 1982, 57-107675; Jul. 24, 1982, 57-111613[U]; Nov. 22, 1982, 57-175612[U]

Int. Cl.[4] F16D *33/00*, *35/00*

U.S. Cl. 192—3.3 **10 Claims**



1. A damper device for a torque converter clutch with a clutch plate for coupling an input case on an input shaft to a turbine vane wheel on an output shaft in which higher fluid pressure differential across the clutch plate causes coupling and lower fluid pressure differential allows slipping wherein the clutch plate is connected to the turbine vane wheel by circumferentially extending springs to allow limited springbiased relative rotation therebetween, the improvement comprising; a fluid communication hole in the clutch plate, a flow control means positioned in association with said hole for opening or closing said hole and having means connected to the turbine vane wheel for tending to close said hole upon relative rotation between the clutch plate and turbine vane wheel caused by higher levels of torque transmission through the springs and tending to open said hole upon lower levels of torque, said flow control means being operated for tending to close the hole upon transmission of torque from said clutch plate to the turbine vane wheel directly through said circum-

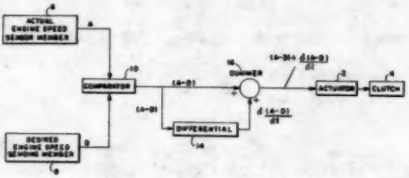
ferentially extending springs by the torque tending to compress said springs.

4,638,898

CLUTCH CONTROL SYSTEM AND CLUTCH ASSEMBLY USING SAME

Eugene R. Braun, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1985, Ser. No. 810,618
Int. Cl.[4] B60K *41/28*
U.S. Cl. 192—0.052 **39 Claims**



1. A clutch control system for controlling rate of engagement between a driven member of a clutch assembly and a driver member of an engine having an adjustable throttle, said system comprising,

a first sensor member operative to provide a first signal corresponding to actual engine speed,

a second sensor member operative to provide a second signal corresponding to a desired engine speed, and

control means operative to receive said first and second signals and provide an output function signal therefrom to an actuator operative to effect the engagement upon receipt of the function signal, said function signal represented by the equation:

$$F = (A-D) + \frac{d(A-D)}{dt}$$

where:

D=desired engine speed

A=actual engine speed

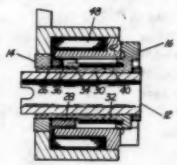
$\frac{d(A-D)}{dt}$ = rate of change of the difference between the actual and desired engine speeds with respect to time.

4,638,899

SIMPLIFIED METHOD OF SECURING THE CLUTCH SPRING TO THE TORQUE INPUT DRUM OF A SPRING CLUTCH, AND RESULTING MECHANISM

John A. Kossett, Columbia Heights, Minn., assignor to Reell Precision Manufacturing Corp., Saint Paul, Minn.

Filed Feb. 28, 1985, Ser. No. 706,633
Int. Cl.[4] F16D *13/08*
U.S. Cl. 192—81 C **5 Claims**



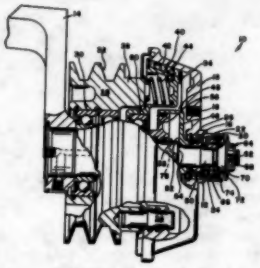
1. A spring clutch mechanism having an endpiece supporting a first drum or hub and grooved to provide a circular groove at least partially surrounding the base of said drum, a second drum coaxially adjacent said first drum, and a helical clutch spring closely surrounding said drums with a terminal coil of said spring permanently bound within said groove against rotation and removal.

4,638,900

FAN DRIVE MECHANISM

Brian C. Deem, Avon Lake, and Jack A. Kemp, Elyria, both of Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Jun. 17, 1985, Ser. No. 745,152
Int. Cl.[4] F16D *25/08*
U.S. Cl. 192—85 CA **12 Claims**



1. Fan drive mechanism comprising a spindle having an axis, a fan plate, bearing means for rotatably mounting said fan plate on said spindle, said fan plate being displacable axially along said spindle upon failure of the bearing means, said bearing means including an inner race mounted on said spindle, an outer race mounted on said fan plate, and means for permitting rotation between said races, and stop means having a surface tapering radially outwardly with respect to said axis of the spindle to define a conical surface for engagement by said means permitting rotation upon separation of the latter from said inner race to thereby limit the axial displacement of the fan plate with respect to said spindle upon failure of the bearing means, a driving member rotatably mounted on said spindle, said driving member including a portion movable axially along said spindle for a predetermined maximum axial distance for driving engagement with said fan plate to form a driving connection between said driving member and said fan plate, said portion moving away from said fan plate to break said driving connection, and fluid pressure responsive means for moving said portion along said spindle, the axial length of said conical surface along the axis of said spindle being sufficiently long to permit movement of said fan plate after failure of said bearing means a distance at least incrementally longer than the maximum axial distance of movement of said portion on said spindle.

4,638,901

STEP OF AN ESCALATOR OR THE LIKE EQUIPPED WITH AT LEAST ONE SAFETY DEVICE

Gerhard Lunardi, Vienna, Austria, assignor to Inventio AG, Hergiswil, Switzerland

Filed Aug. 8, 1985, Ser. No. 763,836
Claims priority, application Switzerland, Aug. 22, 1984, 04014/84
Int. Cl.[4] B65G *43/00*
U.S. Cl. 198—323 **15 Claims**

1. A step for an escalator, comprising:

a step body including a thread surface and a front surface;

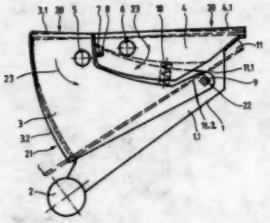
at least one side upright provided for said step body and equipped with a trailing roller;

a stationary skirt guard arranged laterally of said step body in the neighborhood of said at least one side upright;

two segments movably arranged on said step body at the region of said at least one side upright between said step body and said skirt guard;

a common spring provided for said two segments for pressing apart said two segments such that at least one of said two segments assumes a preparatory position at least partially protruding from said step body;

said at least one of said two segments being provided with warning transmission means for engaging a profiled guide



edge of a skirt of the escalator in an active warning position of said at least one of said two segments flush with said step body; and

said at least one of said two segments being shiftable by a load exerted by a passenger acting upon said at least one protruding segment into said active warning position for warning the passenger that the passenger has stepped onto a danger zone of the step body by vibrations of said warning transmission means engaging the profiled guide edge.

4,638,902

MECHANISM FOR AUTOMATICALLY POSITIONING CLAMPING FRAMES

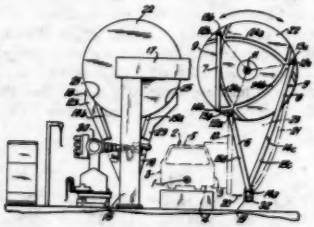
Roman Kellner, Bostetten; Georg Mayr, Friedberg; Karl-Heinz Proksch, and Franz Pöckl, both of Augsburg, all of Fed. Rep. of Germany, assignors to KUKA Schweissanlagen Roboter GmbH, Fed. Rep. of Germany

Filed Apr. 12, 1985, Ser. No. 722,779

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1984, 3414387

Int. Cl.[4] B65G *47/00*

U.S. Cl. 198—345 **12 Claims**



1. A mechanism for holding workpieces of different configurations, comprising:

a plurality of clamping frames each for engaging a workpiece of different configuration and each having first and second spaced apart portions;

rotary motion means rotatably connected to said first portion of each frame for rotating all of said first portions about a common axis, said first portions of said frames being mutually spaced from each other and spaced from said common axis, said rotary motion means comprising a fixed support and a disc rotatably mounted to said fixed support about said common axis, said common axis extending through a center of said disc, and said disc rotatably connected to said first portion of each frame at a location radially spaced from said common axis, said disc including a plurality of curved guideways each having a center of curvature at said first portion of one of said frames, each curved guideway having a radius corresponding to a distance between said first and second portion of each frame with said second portion of each frame being movable into a respective curved guideway when said frame is away from its working position; and

at least one fixed plate mounted below said disc and having at least one fixed guideway for sequentially engaging said second portion of each frame, one at a time, with rotation of said first portions about said common axis, each frame being movable from a standby position to a working position with engagement of its second portion in said fixed guideway and movement of said second portion to a selected location on said guideway.

4,638,903

METHOD OF SEPARATING AND COLLECTING COMMODITIES AND DEVICE FOR THE SAME

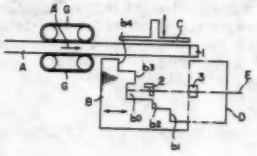
Yoshio Kimura, Tokyo, Japan, assignor to Tetra Pak International Aktiebolag, Lund, Sweden

Filed Jun. 27, 1985, Ser. No. 749,554

Claims priority, application Japan, Jun. 29, 1984, 59-136409

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—419 **2 Claims**



1. A method for collecting articles comprising the steps of:

pushing transversely a predetermined number of articles into a tapered pusher, said articles being arranged longitudinally straight and said tapered pusher having a stepped configuration of a plurality of stages wherein each stage has a longitudinal side substantially equal to a length of said article and a transverse side substantially equal to a width of said article and at least one said stages in a middle portion of the tapered pusher is omitted, and said articles being prevented from entering into said omitted stage of said tapered pusher by a stop means; and

longitudinally advancing said pusher a distance equal to said length of said article so that the articles except for those in front of said omitted stage are pushed out of said pusher in a manner that said articles are grouped on either side of an imaginary line which is drawn from said omitted stage.

4,638,904

ADJUSTABLY POSITIONAL CRANK PIN SUPPORT MEANS FOR WIRE FEEDING APPARATUS

Magnus Randar, Menomonee Falls, and Terry R. Kroening, Cedarburg, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Jun. 27, 1985, Ser. No. 749,401

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—468.2 **9 Claims**

1. Apparatus for feeding a strand of wire comprising:

a pair of wire feed clamps which are connected to a pair of parallel flights of a cable connected to be driven by a cable drum which is oscillatably rotatable between two extreme angular positions, said angular positions determining the axial positions of said parallel cable flights and thus the

extreme operating positions and travel distance of each of said wire feed clamps; drive means to oscillatably rotate said cable drum to effect wire feeding movements of said wire feed clamps;

said drive means comprising a motor and a power output shaft rotatably driven about an axis of rotation by said motor;

a feed crank connected to be rotated by said power output shaft;

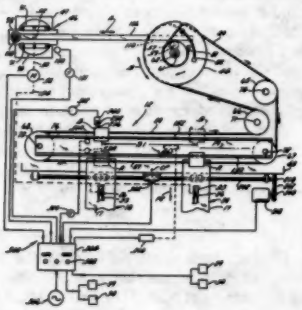
guide means mounted on said feed crank and movable between locking and unlocking positions;

biasing means biasing said guide means to one of said locked and unlocked positions;

a crank pin support member slidably mounted on and disposed between said feed crank and said guide means and being adjustably positionable in fixed positions wherein it can be releasably locked;

a crank pin mounted on said crank pin support member and having a pin axis which orbits around said axis of rotation as said feed crank rotates;

a reciprocably movable elongated drive rod connected to oscillatably rotate said cable drum,



said drive rod being pivotally connected at one end to said crank pin and being drivingly engaged at its other end to rotate said cable drum;

locking means operable to lock and unlock said crank pin support member on said feed crank, said locking means comprising an actuator connected to said guide means and biasing means;

to said guide means and which overcomes the force of said biasing means during movement of said guide means; to unlock said crank pin support member and enable adjustable repositioning of said wire feed clamps, said cable, said cable drum, said drive rod and said crank pin support member so that said wire feed clamps are able to provide a particular length of said wire strand, and said control means being further operable to lock said crank pin support member and entrap said crank pin support member between said guide means and said feed crank and to operate said motor of said drive means to effect wire feeding movements of said wire feed clamps while said crank pin support member is locked.

4,638,905

INCLINED GRATE FOR FURNACES

Manfred Weiss, Lauda-Königshofen, Fed. Rep. of Germany, assignor to Richard Ksblitz GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 645,669

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331156

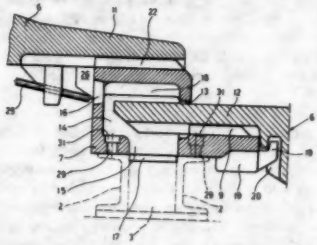
Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—774 **12 Claims**

1. A furnace grate structure over which solid fuel advances in a direction of conveyance as said fuel is combusted, said grate structure comprising:

a plurality of grate beams extending substantially parallel to one another and substantially transversely to said direction of conveyance and supported on a substructure, said beams forming upwardly facing support surfaces;

at least one bank of first and second types of elongated grate bars which extend substantially parallel to said direction of conveyance in spaced relation to each other, said grate bars having upwardly facing support surfaces inclined downwardly in said direction of conveyance for conveying said solid fuel, each of said grate bars being supported at each end thereof on a mounting surface of a respective said grate beam such that said first type of grate bars are



reciprocatingly movable in a substantially horizontal direction and said second type of grate bars are stationary, said bank of said grate bars being defined by alternating ones of said first and said second types of grate bars lying parallel and adjacent to one another;

at least one of said grate beams comprises a plurality of grate beam sections, each beam section having two ends, said grate beam sections being arranged end to end on said substructure to form one of said grate beams having gaps between adjacent grate beam sections; and

keyed engagement means on said grate beam sections for guiding and laterally positioning said reciprocatingly movable and said stationary grate bars such that each of said gaps between said adjacent ends of said grate beam sections are covered by a respective one of said grate bars.

4,638,906

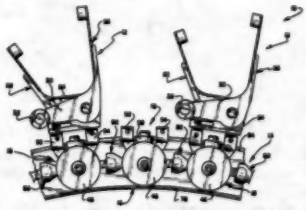
CONVEYOR ASSEMBLY

Michael E. Winiasz, Lorain, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Nov. 19, 1985, Ser. No. 799,402

Int. Cl.[4] B65G *17/12, 39/20, 47/86*

U.S. Cl. 198—803.9 **4 Claims**



1. A gripper conveyor assembly comprising a plurality of gripper means for engaging articles to be conveyed from a first location to a second location, a track extending from the first location to the second location, a conveyor chain connected with said gripper means and movable along said track, said conveyor chain being enclosed by said track and including a

plurality of interconnected links anyone of which can be readily removed from said conveyor chain while the other links remain interconnected and are enclosed by said track, one of said links including a body section connected to one of said gripper means, roller means connected with said body section of said one link for engaging said track to guide movement of said body section along said track, socket means at a first end portion of said body section for receiving a plug of an adjacent link, and a plug at a second end portion of said body section for insertion into a socket means of an adjacent link, said socket means including surface means for defining an opening through which a plug of an adjacent link can be inserted into said socket means when said body section of said one link and the adjacent link are in a first orientation relative to each other and for blocking withdrawal of a plug of an adjacent link from said socket means when said body section of said one link and the adjacent link are in a second orientation relative to each other, said body section of said one link and said one gripper means being rotatable together relative to said track between the first and second orientations, said track including wall means for at least partially enclosing said conveyor chain and for defining a slot through which said one link and said one gripper means are interconnected, said slot including surface means for preventing rotation of said links from the second orientation to the first orientation during movement of said links along said track, said wall means including surface means at least partially defining an opening for enabling said body section of said one link and said one gripper means to be rotated together about the longitudinal axis of said track at the opening from the second orientation to the first orientation and longitudinally disconnected from the adjacent links and laterally moved through the opening while the adjacent links are enclosed by said track.

4,638,907

LAMINATED LAUNDRY PRODUCT

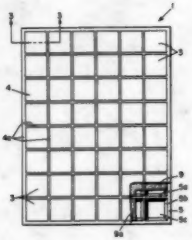
William T. Bedenk, and Kendall L. Harden, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 28, 1984, Ser. No. 675,804

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[4] C11D *17/04*

U.S. Cl. 206—0.5 **29 Claims**



1. A compact, through the wash laundry product comprising:

a laminate of two plies of which at least one ply comprises a strong, high stretch tissue which is deeply embossed to form a multiplicity of nonconnecting cups surrounded by rims;

the tissue in each cup having been stretched 15% to 100% by said deep embossing;

said cups containing a laundry active, said active being selected from powdered detergents, builders, brighteners, softeners, enzymes, bleach solids, fillers, and mixtures thereof;

the other of said two plies covering the deeply embossed ply forming patterned cells which contain the powder, said plies being sealed on said rims to provide said compact, through the wash laundry product;

said high stretch embossed tissue originally having a dry CD stretch of from about 9% to about 25% and a dry MD stretch of from about 30% to about 60%, a wet cross-directional tensile strength of from about 78.7 to about 315 g/cm (200–800 g/in), said one ply selected to withstand the stretching and said two plies selected to survive automatic washing and drying cycles without significant tearing; said tissue having sufficient porosity to permit the laundry actives to dissolve and flow through the tissue.

2. A compact, through the wash laundry product comprising:

a laminate consisting of at least two plies of tissue;

one of said plies being a high stretch tissue which is deeply embossed to form a multiplicity of nonconnecting cups surrounded by rims, said deeply embossed ply being stretched at least 15% to 100% from said deep embossing, said deeply embossed tissue having a wet cross-directional tensile strength of from about 78.7 to about 315 g/cm (200–800 g/in) and a dry CD stretch of at least 12% and a dry MD stretch of from 30% to 60%;

said cups containing laundry active powders selected from powdered detergents, builders, enzymes, softeners, brighteners, bleach solids, fillers, and mixtures thereof;

the other of said two plies of tissue covering the deeply embossed ply forming patterned cells which contain the powder, said plies being sealed on said rims;

said deeply embossed tissue is selected to withstand the stretching and both of said plies selected to survive automatic washing and drying cycles without significant tearing; said tissue having sufficient porosity to permit laundry actives to dissolve and flow through the tissue.

4,638,908

INSERT FOR A MONEY DRAWER

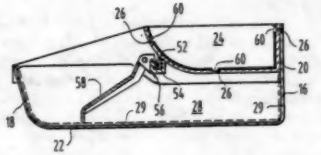
Guenter Baltz, and Wilfried Dobring, both of Berlin, Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,374

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 8409722[U]

Int. Cl.[4] A45C *11/28*

U.S. Cl. 206—0.8 **6 Claims**



1. A combination drawer and insert for receiving coins, currency, bills and the like, in the form of a trough-like receptacle open at the top, characterized by a relatively large area, relatively deep lower tray having partitions defining a plurality of relatively long compartments running from front to rear of said lower tray and sized to accommodate paper currency, a relatively small area, relatively shallow upper tray defining a plurality of relatively short compartments running from front to rear of said upper tray and sized to receive metal currency, and coacting means on said lower tray and on said upper tray for removably mounting said upper tray in the upper rear region of said lower tray so that said upper tray overlies the rear portions of said relatively long currency compartments defined by said lower tray and exposes the front portions of these compartments;

the front edge of the upper tray, when mounted in said lower

tray, being rearwardly spaced from the front edge of the lower tray;

and at least one bill hold-down device mounted on the front edge of the upper tray and having a pivotal hold-down arm extending into a compartment of said lower tray.

4,638,909

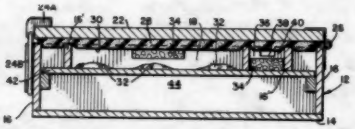
CONTAINER FOR RETAINING PAINT

Thomas E. Ford, 150-24 6th Ave., Whitestone, N.Y. 11357

Continuation of Ser. No. 521,640, Aug. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 385,019, Jun. 4, 1982, abandoned. This application Oct. 11, 1984, Ser. No. 660,010

Int. Cl.[4] B65D *21/00, 81/24*

U.S. Cl. 206—1.7 **5 Claims**



1. In an artist's paint box comprising a bottom wall and vertically extending side walls constructed to define a storage comprtment open only at the top thereof and further comprising a cover having one main surface and constructed to be releasably attachable and movable from an open position to a closed position wherein said one main surface is constructed to superpose said storage compartment and the upper edges of said side walls, the improvement comprising: a storage tray having a planar base and vertical walls extending upwardly from the base to form in said tray a plurality of compartments open only at their tops, means disposed on the side walls for removably supporting the tray in the box with the planar base disposed above the bottom wall and spaced apart therefrom such that the vertical walls of the tray are at substantially the same height as the side walls of the box, a gasket of resilient material completely covering the one main surface of the cover and a non-porous plastic film completely covering the gasket and facing said storage compartment, wherein the gasket is configured to be compressed by the side walls and vertical walls when the cover is in the closed position such that the plastic film coacts with the side walls and vertical walls to fluid-tightly seal the storage compartment from the atmosphere and each of the plurality of compartments from each other and to simultaneously fix the tray in place on the supporting means, whereby the box can be transported by a user without dislocation of the tray in the box or fluid communication between the compartments thereof.

4,638,910

CLEANING WAND CADDY

David J. Bokmiller, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.

Filed Sep. 20, 1984, Ser. No. 652,868

Int. Cl.[4] A45D *44/18*

U.S. Cl. 206—15.2 **3 Claims**

1. A housing for storing a cleaning wand in an upright position, comprising:

a base comprising a bottom, first and second base side walls, and a rear wall, said bottom for supporting a head of said wand thereon during storage of said wand and having a groove therein through which to receive a handle of said wand during storage of said wand;

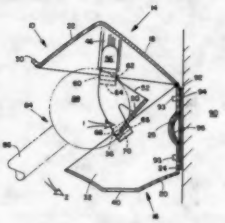
a lid comprising a top, first and second lid side walls, and a front wall, said lid hingedly connected to a top of said rear wall atop said base for placing said housing in an open position upon engagement of said wand head with said lid;

a press plate connected to said lid for placing said housing in a closed position upon engagement of said wand head with said press plate, said housing permitting said wand to be stored in said upright position with said wand handle extending vertically downward relative to said head; and

means for alternately locking said housing in said open position or said closed position, wherein said means for alternately locking said housing in said open or closed position comprises:

a first bracket connected to said first side wall of said lid;

a second bracket connected to said second side wall of said lid, said press plate connected to said first bracket and said second bracket;



a first inwardly protruding boss on said first side wall of said base, said first protruding boss adapted for alternate engagement with or disengagement from an uppermost groove on said first bracket and a lowermost groove on said first bracket; and

a second inwardly protruding boss on said second side wall of said base, said second protruding boss adapted for alternate engagement with or disengagement from an uppermost groove on said second bracket and a lowermost groove on said second bracket.

4,638,911

PACK AND PROCESS FOR THE MANUFACTURE THEREOF

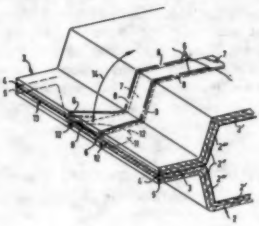
Helmut Prohaska, St. Polten, Austria, assignor to Folienwalzwerk Brueder Teich Akitenesellschaft, Obergrafendor Muhlhofen, Austria

Continuation of Ser. No. 261,157, Apr. 20, 1981, abandoned. This application May 21, 1985, Ser. No. 736,476

Claims priority, application Austria, Jun. 19, 1980, 00017/80

Int. Cl.[4] B65D *17/34*

U.S. Cl. 206—611 **2 Claims**



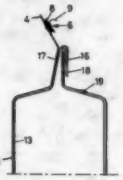
1. Pack for the packaging of articles to be packed with a wrapping having a tear-open member and consisting of a thin flexible and foldable packaging material, the packaging material having at least one double region with an exposed edge in which said packaging material forms two layers bonded to one another with a bonding agent and on which the start of the tear-open member is located, one of said layers being an extension of a part of the wrapping in which the tear-open member is located, characterized in that the thin packaging material, having lines of weakness formed in the material before formation of the pack, comprises a carrier layer which is provided along said lines of weakness with perforations at least over

discrete sections and a non-perforated proofing layer which is bonded to the carrier layer and which is covered, in turn, with a sealing layer comprising the bonding agent, that the tear-open member is located between lines of weakness in the packaging material and that the layer (4) of the double region which is the extension of the wrapping part in which the tear-open member is located has a portion within which the start of the tear-open member is located and which lies opposite a region (11) located in the other layer (5) of the double region, this region (11) being encircled at least almost completely by lines of weakness (12) of the packaging material of this other layer (5) and an exposed straight edge of the double region (13), the two packaging layers being sealed together on their non-perforated proofing layers.

4,638,912
PACKAGE WITH TRANSFERABLE REUSABLE CLOSURE ELEMENT

Heinrich Graf, Beringen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Apr. 10, 1985, Ser. No. 721,802
Claims priority, application Switzerland, Apr. 30, 1984, 2111/84
Int. Cl.⁴ B65D *33/16*
U.S. Cl. 206—621 **7 Claims**



1. In a reclosable package having a generally rectangular outer wrapper including a top closure formed of panels folded to one another and against a top face of the package; a flap constituting a continuation of one of the panels; the improvement comprising a hook-and-eye fastener having hook and eye components attachable to and separable from one another; one of said components being permanently affixed to a face of said flap and the other component being readily removably carried on said one component and having a reverse side; and means for permanently attaching said other component by said reverse side to an external location of said wrapper, whereby for reclosing said package after an initial opening thereof, said other component being transferable from said one component for permanent attachment to said wrapper, and said flap being positionable over said wrapper such that said components are in alignment for engagement with one another.

4,638,913
MULTIPLY PACKAGE HAVING DELAMINATING EASY OPEN SEAL

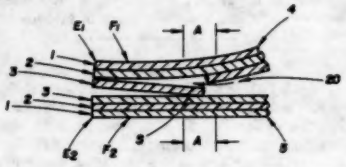
Milton A. Howe, Jr., Spartanburg, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Aug. 21, 1981, Ser. No. 295,157
Int. Cl.⁴ B65D *77/12*
U.S. Cl. 206—632 **7 Claims**

1. An easy open seal for an opening in a receptacle of thermoplastic film, said film having at least two layers wherein the tensile or rupture strength of the outer surface layer is greater than the bond strength between the outer layer and its adjacent layer comprising:

(a) at least one fold in said film, said fold being adjacent a film edge which forms said opening, said fold providing direct contact between two surface areas of said outer layer;

(b) a seal between said two surface areas, said seal being located between said fold and said film edge and said seal closing said opening; and,

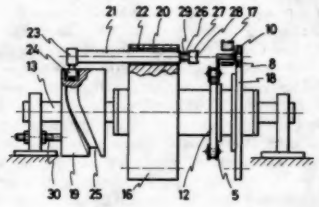


(c) said fold providing a tab which may be pulled to rupture one of said outer layers at said seal and causing said outer layer to delaminate from its adjacent layer to the edge of the film thereby opening said receptacle.

4,638,914
FRUIT SELECTING MACHINE

Juan C. Ollero-Pina, and Antonio Garrido-Diaz, both of Seville, Spain, assignors to Sociedad Anonima de Racionalizacion y Mechanizacion, Seville, Spain

Filed Jan. 16, 1985, Ser. No. 691,931
Claims priority, application Spain, Aug. 10, 1984, 281046[U]
Int. Cl.⁴ B07C *5/07*
U.S. Cl. 209—617 **8 Claims**



1. A machine for sizing an input stream of fruit such as olives into at least two separate output streams, comprising:

an endless conveyor entrained about longitudinally spaced, transversally extending wheel means, including an upstream wheel means and a downstream wheel means, so as to have a carrying run and a return run; said conveyor having a plurality of longitudinally spaced pushers mounted thereto, each such pusher being adapted to accept a single fruit to be sized and to push that fruit along said carrying run;

a hopper associated with said carrying run of said conveyor towards an upstream end of such run, this hopper being adapted to receive a plurality of fruit to be sized; and to supply such fruit individually to said conveyor so that each fruit is pushed by a respective said pusher;

a sizing means associated with said downstream wheel means and adapted to rotate coaxially therewith, this sizing means including a plate means disposed laterally to one side of said endless conveyor, and a drum means disposed laterally to the opposite side of said endless conveyor; a plurality of shank means mounted to said drum means for reciprocal movement towards and away from said plate means; each said shank means being provided with a head which spacedly confronts said plate means; a relatively stationary cam channel-providing member having a cam channel provided therein; each said shank having a cam follower connected therewith and received in said cam channel; said cam channel being configured to have at least two shank head position-con-

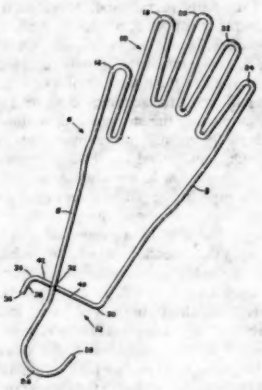
trolling segments, in one of which each shank head in succession is brought to a predetermined magnitude of proximity to said plate means as that shank head is rotated together with said downstream wheel means until said downstream wheel means has passed an undersized fruit unloading station located rotationally past top dead center of said drum means, and in a succeeding another one of which each shank head in succession is withdrawn to a position of greater spacing from said plate means as that shank head is rotated together with said downstream wheel means through an oversized fruit unloading station; each said shank head being adapted to be so aligned axially of said wheel with a respective said pusher as to engage, in use, the respective fruit being pushed by that pusher with sufficient compressive force to trap that fruit against said plate means only so long as said cam follower of the respective said shank is disposed in said one shank head position-controlling segment and only if that fruit is at least equal in linear dimension laterally of said conveyor to a predetermined linear dimension, whereby undersized fruit do not become trapped by said shank heads against said plate means and fall from said conveyor at said undersized fruit unloading station, whereas oversized fruit do become so trapped and are conveyed by said conveyor past said undersized fruit unloading station until said shanks are withdrawn and said oversized fruit fall from said conveyor at said oversized fruit unloading station.

4,638,915

GLOVE HOLDER FOR DISH DRAINER

Mitzi Kaplan, 280 Argyle Rd., Brooklyn, N.Y. 11218

Filed Oct. 28, 1985, Ser. No. 791,931
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 **4 Claims**



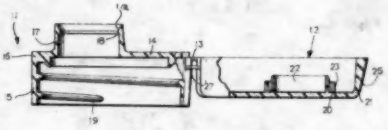
1. A glove holder comprising a unitary member having a first portion configured to receive a rubber glove thereover and a second portion configured for releasable engagement with a wire dish drainer to hold said glove holder selectively in either an upright, glove drying position or an inconspicuous folded down position, said member having five loops in said first portion corresponding with the thumb and fingers of said glove, the thumb loop and the loop for the little finger providing said holder with two extreme loops and said member extending to said second portion from said extreme loops, said second portion including a first open hook formed in the part of said member extending from one of said extreme loops and a second open hook formed in the part of said member extending from the other of said extreme loops, said hooks being located at the ends of said member with said first hook generally facing said first portion and said second hook generally facing away from said first portion, said hooks providing means for releasably engaging therebetween wires of said wire dish drainer to hold said glove holder in said upright, glove drying position and at least one of said hooks providing means to hold releasably a wire of said dish drainer to hold said glove holder in said folded down position.

4,638,916

CLOSURE WITH SNAP-TYPE HINGE CAP

James M. Beck, Carol Stream, and Robert D. Rohr, Elgin, both of Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 12, 1985, Ser. No. 754,796
Int. Cl.[4] B65D *43/14*
U.S. Cl. 215—235 **8 Claims**



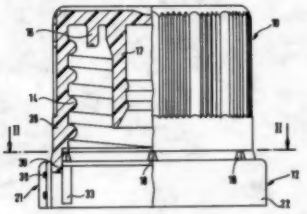
1. A closure with a snap type hinge cap comprising
a first part adapted to interengage with the open neck of a container,
a second part forming a cap and
an integral hinge interconnecting the first and second parts,
each of the first and second parts comprising a base wall and a peripheral skirt,
a pair of hinge straps extending from the skirts on opposite sides of the integral hinge,
the ends of the straps being positioned in recesses in said skirts,
said straps being substantially straight when said first part and second part are in open position,
said integral hinge having a flat top surface and an inverted V-shaped bottom surface.

4,638,917

TAMPER PROOF CLOSURE

Alois Persch, Zell, Fed. Rep. of Germany, assignor to Zeller Plastik Koehn, Graebner & Co., Zell, Fed. Rep. of Germany

Filed Dec. 12, 1985, Ser. No. 808,265
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **6 Claims**



1. A tamper proof closure for a threaded container mouth having first lock elements thereon, said closure comprising:
(a) a plastic screw cap for sealing said mouth;
(b) a jacket divided into segments defining a ring around said cap for enclosing said mouth in a closed state;
(c) tear-off elements connecting said jacket and cap;
(d) connection strips located between said segments defining predetermined rupture sites;
(e) each of said segments provided with an approximately radially extending inside flange, said flange circumferen-

tially shorter than said jacket, said flanges defining apertures between them;

(f) at least one catch on said cap adapted to enter said apertures; and

(g) second lock elements provided inside said ring and cooperating with said first lock elements which facilitate relative rotation of said ring with respect to said mouth during a screwing shut motion but lock when screwing off.

4,638,918

BOTTLE STOPPER

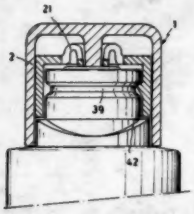
Carlos Marzábal Martínez, Barcelona, Spain, assignor to Antonio Puig, S.A., Barcelona, Spain

Filed Dec. 10, 1985, Ser. No. 807,255

Claims priority, application Spain, Feb. 19, 1985, 540.507

Int. Cl.[4] B65D *41/18, 41/34*

U.S. Cl. 215—295 **11 Claims**



1. A stopper for bottles having a neck and comprising a cup shaped outer body member having a lateral skirt member, a base portion and an axial shank extending from the inner portion of the base portion in the centre thereof; and a resilient inner body member comprising a portion for attachment to the outer body member and a hollow sealing member within which there is inserted said axial shank and which is adapted to be inserted in the neck, characterized in that a plurality of bridges extend between said attachment portion and said hollow member connecting said attachment portion and said hollow member.

4,638,919

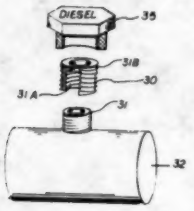
VEHICLE FUEL TANK CONSTRUCTION

Robert A. Feenick, 20 Buchanan St., Pearl River, N.Y. 10965

Filed Mar. 31, 1986, Ser. No. 846,275

Int. Cl.[4] B65D *41/04*

U.S. Cl. 220—288 **5 Claims**



4. A fuel tank construction for use on a vehicle comprising

a body portion defining a reservoir for containing a supply of diesel fuel,

a fuel inlet having an inlet opening connected to said body portion,

said fuel inlet having a thread portion adjacent said inlet opening,

an adapter means forming an extension of said fuel inlet,

said adapter means comprising a tubular member having an internal threaded portion at one end and an external threaded portion at the other end thereof,

said internal threads complementing the threaded portion of said fuel inlet,

and said external threaded portion being left handed threads, and a cap defining a closure for said adaptor means,

said cap having internal threads complementing said external threads to mate therewith.

4,638,920

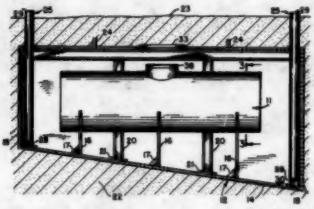
UNDERGROUND FACILITY FOR STORAGE OF LIQUIDS

George S. Goodhues, Jr., 106 Homeland Ave., Baltimore, Md. 21212

Filed Jun. 26, 1984, Ser. No. 624,913

Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—445 **16 Claims**



1. An underground facility for the storage of liquids, comprising a fabricated unitary structure adapted to be lowered into the ground as a unit and buried therein, the structure including a substantially rectangular, substantially totally enclosed vault having a top wall, a bottom wall, and four side walls therebetween, the side walls forming respective corners therebetween, a storage tank substantially disposed completely within the vault, the vault and tank having an access clearance therebetween sufficient to accommodate a repair person, spaced means supporting the storage tank within the vault, at least one substantially vertical pipe supported within the vault and disposed substantially adjacent to a respective corner thereof, the pipe having a lower end terminating above the bottom wall, the pipe further having an upper end extending through the top wall and above the ground, the pipe being sufficiently large to suitably accommodate a rod therein, thereby facilitating the detection of leaks from the storage tank into the vault, and the top wall having means therein providing access to the interior of the vault, whereby in situ repairs may be made to the tank, the bottom wall being inclined downwardly with respect to the top wall, wherein the vault has a lowermost portion at one end thereof for accumulation of leakage from the tank, wherein the pipe terminates just above the lowermost portion, and wherein the spaced means supporting the tank within the vault accommodates the relatively unimpeded flow of any leakage from the tank along the inclined bottom wall of the vault to the lowermost portion thereof.

4,638,921

DEVICE FOR DISPENSING INDIVIDUAL SHEETS FROM AN ARRAY OF STACKED SHEETS

Wayne C. Sigl, Neenah, and Elizabeth A. Wolfson, Menasha, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 776,554, Sep. 16, 1985, abandoned. This application Oct. 11, 1985, Ser. No. 786,892

Int. Cl.[4] A47K *10/20*; B65H *3/00*

U.S. Cl. 221—1 **17 Claims**

10. A method for sequentially dispensing individual liquid-impregnated sheets from an interfolded array of said sheets

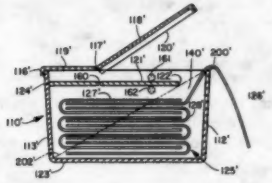
while presenting a next available sheet from said array in a graspable position outside of a container, comprising the steps of:

a. holding said array of sheets in the container;

b. transversely hinging within the container a guide means, which is capable of being moved with reference to a hinge to allow a user to reach an uppermost sheet in the stacked array;

c. withdrawing said sheets from said array along a dispensing direction;

d. contacting a first surface of said sheets with said guide means to direct said sheets along a first curvilinear path which curves in a direction substantially perpendicular to



said first sheet surface while maintaining the cross-wise, transverse dimension of said sheets in a substantially linear, straight-line configuration; and

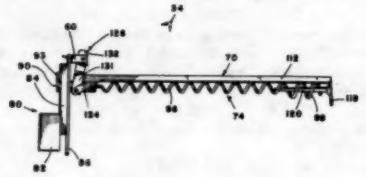
e. contacting an opposite surface of said sheets to direct said sheets along a second curvilinear path, which curves in a curvature direction that is generally opposite to the curvature direction of said first curvilinear path, while maintaining the cross-wise, transverse dimension of said sheets in a substantially linear, straight-line configuration, thereby drawing an overlapping portion between a preceding sheet and a next successive sheet along a generally zig-zag path to induce a separation of the individual sheets and present said successive sheet in said graspable position.

4,638,922

SHAKE COMPENSATED HOLE-PUNCHED PRODUCT VENDING SYSTEM

J. Stephen Stoltz, Conway, Ark., assignor to Stoco Industries, Inc., Conway, Ark.

Filed Jun. 6, 1985, Ser. No. 742,019
Int. Cl.[4] G07S *11/36*
U.S. Cl. 221—75 **4 Claims**



1. A product vending module for deployment within a coin operated vending machine for selectively dispensing suitable hole punched products, said module comprising:

rigid frame means for operationally mounting said module within said vending machine;

elongated, helical spindle means extending perpendicularly outwardly from said frame means for supporting a plurality of punched products to be vended, said spindle means adapted to be rotated to vend a product, said spindle means comprising convolutions of a first predetermined diameter along a major portion of its length and terminating in integral convolutions of an increased diameter along a lesser portion of its length;

security bar means projecting toward said frame means and interiorly of said increased diameter convolutions of said spindle means for preventing product from moving relative to said convolutions without rotation of said spindle means whereby to prevent an unauthorized vend; and,

elongated cover plate means extending above and generally parallel to said spindle means, said cover plate means comprising:

an elongated generally rectangular main body portion disposed above said spindle means and having a remote end terminating adjacent said increased diameter convolutions of said spindle means;

a bracket portion hinged to said frame and pivotally coupled to said main body portion whereby to secure said cover plate means and to permit selective axial displacement of said main body portion relative to said spindle means;

downwardly turned tab means defined at the remote end of said main body portion upon which said security bar means is mounted and from which said security bar means projects toward said frame generally concentrically interiorly of said increased diameter spindle means convolutions; and,

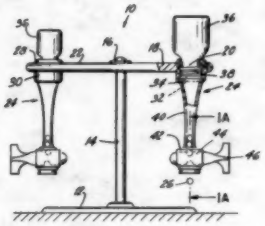
spring means normally biasing said bracket portion toward said frame means whereby to yieldably urge said security bar means interiorly of said spindle means.

4,638,923

GRAVITY FEEDING PILL MEDICINE DISPENSER

Isaiah H. Mines, Jr., and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007

Filed Apr. 8, 1985, Ser. No. 721,222
Int. Cl.[4] G07F *11/00*
U.S. Cl. 221—132 **1 Claim**



1. A gravity feeding pill dispenser which comprises:

(a) a base plate being weighted for stability;

(b) a vertical shaft mounted to center of said base plate;

(c) a ball bearing rotator mounted to top of said vertical shaft;

(d) a caddy disc having a plurality of apertures around perimeter, said caddy disc rotatably mounted at center to said ball bearing rotator;

(e) means for dispensing pills from each said aperture of said caddy disc, wherein each said dispensing means comprises:

(f) a first resilient gasket for fitting within an aperture in said caddy disc;

(g) an inverted bottle top formed on underside of said caddy disc below said aperture, said bottle top having an opening therethrough;

(h) a push-in pill bottle having a beaded neck for engagement with said first resilient gasket;

(i) a clear feeder tube extending downwardly from said opening of said bottle top;

(j) a second gasket for fitting on bottom end of said feed tube;

(k) a sealed cylinder having a turn key stop cock, said sealed cylinder affixed to said bottom end of said feeder tube

whereby one turn key stop cock dispenses one pill therefrom, wherein said push-in pill bottle further comprises:

(l) a resilient skirt extending downwardly from said neck for engagement to top side of said caddy disc to stabilize said pill bottle and ensure freshness;

(m) a base of said pill bottle having an aperture therethrough; and

(n) a cap having an aperture, said cap rotatably affixed to said base of said pill bottle so that when said aperture of said cap lines up with said aperture of said base, pills can be refilled within said pill bottle without removing said pill bottle from said caddy disc.

4,638,924

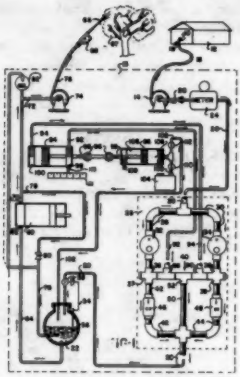
SELF MIXING SPRAYER

Horace R. Newsom, 5514 Cypress Ct., Midland, Tex. 79707

Filed Oct. 24, 1984, Ser. No. 664,234

Int. Cl.[4] G05D *11/03*; F16K *11/07*

U.S. Cl. 222—1 **17 Claims**



1. A process for combining

a. at least one concentrate and

b. water

wherein the improved method for combining the concentrate in a desired mixture proportion with water comprises the steps of:

c. flowing water from a source of water under pressure to a mix tank through one of two control valves;

d. switching one of the two control valves open and the other control valve closed, then

e. operating by the control valves a shuttle device that reverses power fluid connection of the source and the mix tank to each of two power chambers of a set of two proportioning pumps, each pump having two chambers separated by a movable pressure member, with the pressure members operatively connected so that reciprocation of one member reciprocates the other member,

f. fluidly connecting the source of water to one of the power chambers and

g. fluidly connecting the other power chamber to the mix tank, then

h. flowing water from the source of water under pressure to the one power chamber,

i. moving the pressure members of the proportioning pump set a proportioning stroke with water pressure, while

j. decreasing the volume of the other power chamber with the movement of the pressure members and

k. flowing water from the other power chamber to the mix tank,

l. increasing the volume of a concentrate chamber of the proportioning pump chambers with the movement of the pressure members and

m. withdrawing a preselected amount of concentrate from a reservoir fluidly connected to the concentrate chamber, and

n. measuring the amount of water flowed to the mix tank since the last switching step, then

o. switching the other control valve open and the one control valve closed responsive to measuring the flow of a unit amount of water since the last switching step,

p. operating the shuttle device to reverse the power fluid connections,

q. fluidly connecting the source to the other power chamber, and

r. fluidly connecting the one power chamber to the mix tank, then

s. flowing water under pressure from the source to the other power chamber,

t. moving the pressure members of the proportioning pump set a reverse proportioning stroke with the water pressure, while

u. decreasing the volume of the one power chamber with the reverse movement of the pressure members and

v. flowing water from the one power chamber to the mix tank,

w. decreasing the volume of the concentrate chamber with the reverse movement of the pressure members and

x. dispensing the withdrawn concentrate into the mix tank through a fluid connection of the concentrate chamber and the mix tank, and

y. measuring the amount of water flowed to the mix tank since the last switching step, then

z. switching the one control valve open responsive to measuring the flow of a unit amount of water since the last switching step,

aa. repeating the operating step "e." through the switching step "z.",

bb. the preselected amount of concentrate dispensed into the mix tank during each reciprocation of the pressure members being substantially in the same proportion to two of the measured unit amounts of flowed water as the desired mixture proportion,

bb'. measuring the level of mixture in the mix tank, and

bb". closing both control valves when the level of the mixture in the mix tank reaches a preselected maximum.

4,638,925

APPARATUS FOR VOLUMETRIC METERING AND DISPENSING OR LIQUIDS

Norbert Buchner, Winnenden; Kuno Lemke, Bietigheim-Bissingen, and Günter Vögele, Schönaich, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 2, 1985, Ser. No. 718,969

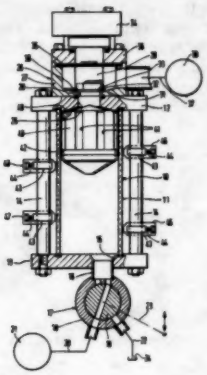
Claims priority, application Fed. Rep. of Germany, May 12, 1984, 3417696

Int. Cl.[4] B67D *5/30*

U.S. Cl. 222—21 **4 Claims**

1. An apparatus for the volumetric metering and dispensing of quantities of liquid, having a jacketed dispensing chamber, a bottom in said chamber provided with a valve-controlled inflow and outflow and a top on said chamber having a vent opening, and a reciprocable float means in said dispensing chamber, further wherein said float means comprises a detectable material thereon which is scannable by a scanning element, further that said apparatus comprises at least two scanning elements disposed at different height locations exteriorly of said jacketed dispensing chamber, one of said scanning elements arranged to cause a controlled retarded inflow and another of said scanning elements arranged to cause or controlled retarded outflow of said liquid, at least one responsive scanning element arranged to control said valve is disposed so

that its height is adjustable outside said jacket of said dispensing chamber, and a controllable throttle device associated with



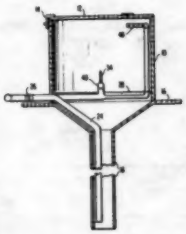
said vent opening and controllably positioned by at least one of said scanning elements.

4,638,926

WETTABLE SPRAY BOX

James R. Brock, 1401 N. Rhodes St., No. 405, Arlington, Va. 22209

Filed Oct. 31, 1985, Ser. No. 793,551
Int. Cl.[4] B67B *7/24*
U.S. Cl. 222—82 **6 Claims**



1. A wettable spray box for dispensing wettable agricultural spray powders in a tank of spray equipment so as to protect the operator from exposure to the powders comprising:

a closable and sealable box for attachment to said tank for receiving a bag of wettable spray powder, said box having a base with an opening, said base being mateable with an opening of said tank to provide a direct access from the base opening to the tank;

a fill pipe for connection to a source of water under pressure and extending into said box to supply water to said tank through the base opening of said box;

a stationary knife within said box positioned to slit open a bag of wettable powder when it is inserted into said box, wettable powder from said bag being allowed to fall freely through the base opening of said box into said tank; and

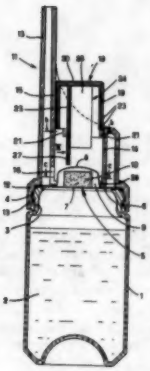
an injector nozzle adjacent a cutting edge of said stationary knife for connection to a source of water under pressure to inject water into an opened bag of wettable powder and expel the powder into said tank.

4,638,927

CONTAINER FOR STORING AND DISPENSING A LIQUID PRODUCT AND AT LEAST ONE ADDITIONAL PRODUCT WHICH ARE TO REMAIN SEPARATED DURING STORAGE

Bruno P. Morane, Neuilly, France, assignor to L'Oreal, Paris, France

Filed May 8, 1985, Ser. No. 731,875
Claims priority, application France, May 15, 1984, 84 07497
Int. Cl.[4] B65D *25/08*; B67D *5/56*
U.S. Cl. 222—83 **9 Claims**



1. In a storage and dispensing container for a liquid product and at least one other additional product in liquid or powder form, comprising:

(a) a bottle containing said liquid product;

(b) a neck to said bottle, said neck having an end edge;

(c) a cap on said neck;

(d) a dispenser fitting to said cap;

(e) a leakproof envelope having two opposed wall portions and a peripheral flange held on said end edge of the bottle neck and containing said at least one additional product;

(f) perforator means in said cap slidably mounted in relation to the bottle neck and located, during storage of said liquid product and at least one additional product, in a position opposite the leak proof envelope, said perforator being adapted to slide from said position through a distance for it to effect perforation of said two opposed wall portions of the leakproof envelope; the improvement wherein

(g) said cap comprises central duct means enclosing the slidably mounted perforator means and

(h) said dispenser fitting comprises an eccentric duct means or said cap;

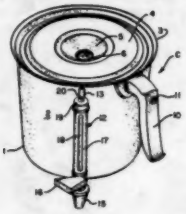
said perforator means having an upper portion with a push button integral therewith, said push button comprising a peripheral skirt surrounding said upper portion of said perforator means and said peripheral skirt being slidable along the internal surface of the central duct means of the cap, said lower portion of said skirt of said push button including gap means allowing the contents of the bottle to pass in a substantially radial direction towards the eccentric duct means for dispensing, after said perforator means has been depressed and said leakproof envelope has been perforated.

4,638,928

HOT BEVERAGE CONTAINER

Joseph P. Webster, St. Charles County, Mo., assignor to Newco Enterprises, Inc., St. Charles, Mo.

Filed May 29, 1984, Ser. No. 614,538
Int. Cl.[4] B67D *5/38*
U.S. Cl. 222—155 **7 Claims**



1. In a hot beverage container for use in conjunction with a heater and of the type incorporating a vessel normally having side walls and for holding a supply of brewed beverage for dispensing and consumption, incorporating a handle for ease of handling, and having a lid for retaining heat and moisture, the improvement which comprises, said container having an integral bottom useful for resting upon a warmer, said bottom being recessed in shape to stimulate the retention of uniformly maintained heat proximate said formed bottom while preventing the buildup of excessive heat that otherwise induces beverage scalding during its heat maintenance, said container bottom including an integral rim formed peripherally of the container and aligned with its side walls, and extending downwardly of its formed bottom, said container bottom and rim providing a pocket inwardly thereof for sustaining uniform heat retention, said container having an integral and continuous upstanding sidewall, a gauge means mounting to the container upon its sidewall, said gauge means including connector tubes securing to proximate the upper and lower edges of the container, and at least the lower connector tube opening through to the interior of the container thereof, a support tube interconnecting approximately vertically between the connector tubes, said support tube having a cut-out portion formed therethrough, and a transparent tube provided within the support tube and forming a fluid tight seal with either of the support or connector tubes, and providing a viewing of the beverage level sustained within the container, said gauge means including a vent opening therein, said vent opening being above the lowermost level of the container lid, and the lower connecting tube extending further outwardly thereof of the support tube and incorporating a tap thereon for dispensing beverage therefrom.

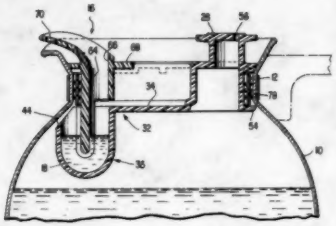
4,638,929

INJECTION MOLDED, SELF SEALING TOP ASSEMBLY FOR OPEN MOUTH COFFEE POTS

Wayne B. Stone, Jr., Bethesda, Md., assignor to Wood Manufacturing Co., Inc., Flippin, Ark.

Continuation-in-part of Ser. No. 532,980, Sep. 16, 1983. This application Apr. 10, 1984, Ser. No. 598,767
Int. Cl.[4] G01F *11/26*
U.S. Cl. 222—456 **2 Claims**

1. A top assembly for an open mouth coffee pot through which coffee is introduced from the exterior of a pot to the interior thereof and subsequently dispensed from the interior of a pot externally thereof; said top assembly having liquid flow passage means extending therethrough; said flow passage means including a liquid trap for retaining a volume of coffee therein following the introduction of coffee therethrough into a coffee pot and for retaining a volume of coffee therein following the dispensing of coffee therethrough from a coffee pot; said top assembly including two injection molded parts; the first of said parts having a bottom wall comprising a floor and a liquid holding well continuous therewith, in gravity flow relation, along a first peripheral portion of the well bounding wall; a second peripheral portion of said well bounding wall terminating below the level of said floor to define an overflow weir for liquid flowing from said floor into said well; the second of said parts being interfitted with said first part to define said liquid trap; said second part including a divider wall bridging said well and separating said first and second peripheral portions of said well bounding wall; said divider wall extend-



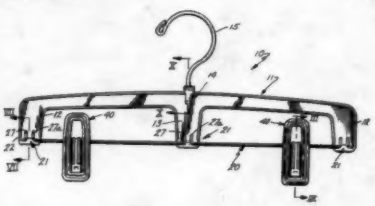
ing from a level above the floor of said first part down into said well and terminating below the level of said floor and above the bottom of said well whereby liquid will gravity flow from said floor across said first peripheral portion of the well bounding wall, down to the bottom of the well, beneath the lower end of the divider wall and across the overflow weir; seal means for sealing said top assembly with respect to the open mouth of a coffee pot; and restricted vent means opening on opposite sides of said seal means.

4,638,930

HANGER LEG MOUNTING STRUCTURE FOR A SUPPORT ROD

Russell O. Blanchard, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.

Filed Oct. 23, 1985, Ser. No. 790,492
Int. Cl.[4] A41D *27/22*
U.S. Cl. 223—85 **6 Claims**



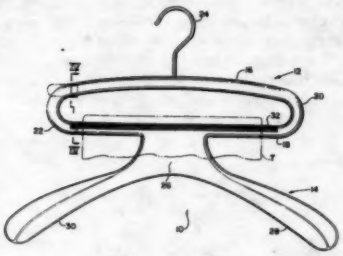
1. A hanger for articles, said hanger having a rigid elongated body, the ends of said body extending downwardly to form a pair of depending legs; a rod extending between the lower ends of said legs; each of said legs having a rod receiving pocket, said pocket having a laterally extending opening, an upstanding lip forming the bottom edge of said opening and defining one wall of a rod seat in said pocket, a resilient depending tongue forming the top of said pocket and spaced froms aid edge of said lip a distance less than the cross section of said rod whereby said tongue has to be deflected to pass said rod through said opening into said rod seat, and upon location of the rod in said seat return of said tongue to its normal position locks the rod against unintentional release from its sear; a finger projecting from the bottom end of said tongue away from said opening, the lower face of said finger being inclined upwardly away from said opening to provide a wedging effect biasing the rod away from said opening.

4,638,931

COMBINATION GARMENT HANGER

Robert L. Rieser, 4 E. High Rd., Port Washington, N.Y. 11050

Filed Feb. 18, 1986, Ser. No. 830,204
Int. Cl.[4] A47G *25/18*
U.S. Cl. 223—88 4 Claims



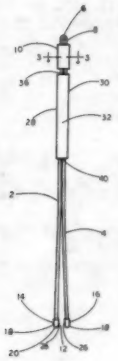
1. A combination suit hanger comprising an oblong planar frame having an upper bar provided with means for suspending said hanger from a support, a horizontally disposed lower bar over which a pair of trousers can be positioned and a pair of U-shaped end sections connecting the respective ends of said upper and lower bars, and an arched shoulder support depending fixedly from said lower bar substantially in the plane of said frame over which a jacket can be draped, one of said U-shaped end sections having its legs integrally formed with the upper and lower bars, the other of said U-shaped end sections having one leg pivotally journaled to one of said upper and lower bars permitting the other leg to swing between a first position in alignment with the other bar within the plane of said oblong frame to close said frame and a second position removed from alignment with said other bar to form a space in said oblong frame permitting the lateral insertion of said trousers into said oblong frame for positioning on said lower bar.

4,638,932

COMBINATION TOOL TO PULL UP AND REMOVE SOCKS, SHORTS AND TROUSERS

Henry C. Keller, 930 E. Lake St., Aurora, Ill. 60506

Filed Dec. 4, 1984, Ser. No. 677,963
Int. Cl.[4] A47G *25/80*
U.S. Cl. 223—111 6 Claims



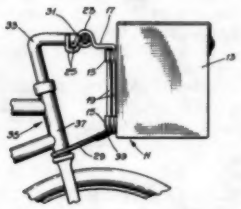
1. A tool to help in putting on and removing an article of clothing comprising elongated extension means to enable a user to reach beyond the end of his toes therewith without bending, said elongated extension means comprising a pair of elongated arms of circular cross section disposed in a side by side flexible, spring-like relationship and where one of said arms diverge slightly from the other, said elongated arms are at least 20 inches in length and are integrally joined at one end in a U-bend, jaw means at the other end of said elongated arms, said jaw means are adapted to receive and grasp a single edge portion of an article of clothing, said jaw means being movable between a jaws open position and a jaws closed position, handle means attached to said integral end of said elongated arms, said extension means further comprises operating means to manually operate said jaws means between said jaws open position and said jaws closed position, said operating means comprising and elongated rigid cylindrical member having an elongated cylindrical bore therein adapted to surround said elongated arms, said operating means being manually movable between a first position where the jaws are in the said open position and a second position where the jaws are in the said closed position, and wherein said operating means is adapted to move said jaw means into tighter gripping engagement the further said operating means is manually moved in the jaws closing direction, said jaw means having a first and second gripping means, each of said gripping means comprising a pad of resilient cushioning material, said resilient cushioning material comprising a body member having a top wall, bottom wall, broad side surfaces, a recess in said top wall to receive one of said elongated arms and a tapered portion converging toward said bottom wall.

4,638,933

PORTABLE FRONT BIKE PACK ASSEMBLY

Richard Boufford, 1983 Westminster, Costa Mesa, Calif. 92627, assignor to Richard Boufford, Newport Beach, Calif.

Filed May 28, 1985, Ser. No. 737,790
Int. Cl.[4] B67J *7/00*
U.S. Cl. 224—41 14 Claims



1. Front pack and support assembly for detachable connection to the gooseneck and handlebar intersection of a bicycle frame comprising:

(a) a pack having support engaging members mounted on an outer surface thereof; and

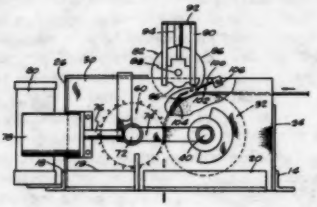
(b) a pair of independently rotatable rigid pack supports, each of said pack supports having first portions adapted to rotatably engage said pack support engaging members and second portions adapted for overlapping engagement about the gooseneck and handlebar intersection of a bicycle, each of said second portions being independently rotatable between a first position along the surface of the pack and a second position wherein said second portions extend from the surface of the pack for engagement about the gooseneck and handlebar intersection of the bicycle.

4,638,934

SLITTING AND DICING MACHINE FOR FIBERGLASS MAT AND MATS OF OTHER BRITTLE ABRASIVE FIBERS

Jerry Fram, 13231 Louvre St., Arleta, Calif. 91331

Filed Oct. 2, 1984, Ser. No. 656,863
Int. Cl.[4] B26F 3/00
U.S. Cl. 225—97 7 Claims



1. Apparatus for slitting matting of brittle fiber material, comprising:

a frame;

a generally cylindrical anvil roller rotatably mounted on the frame, the outer cylindrical surface of the anvil roller having its outer cylindrical surface substantially covered with an elastomeric material;

a generally cylindrical cutter roller rotatably mounted on the frame;

a plurality of cutting blades disposed lengthwise on an outer surface of the cutter roller, the cutter roller being mounted with respect to the anvil roller such that the cutting blades deform the elastomeric surface of the anvil roller sufficiently to cut brittle fiber material by breaking the fibers;

a slicing roller including a plurality of spaced-apart cutting discs rotatably mounted on an axis parallel to the axis of the anvil roller and disposed with respect to the anvil roller such that the cutting discs on the slicing roller deform the elastomeric material on the anvil roller sufficiently to cut brittle fiber material by breaking the fibers;

a plurality of feed fingers resiliently mounted adjacent the anvil roller, each feed finger extending between adjacent cutting discs extending from the slicing roller, each feed finger having a distal end bent in the direction of the line of contact of the anvil roller and the cutter roller;

means for spring biasing the feed fingers toward the anvil roller; and

a feed path through which the mats of brittle fiber material are fed, first between the slicer roller and the anvil roller and, second, between the cutter roller and the anvil roller.

4,638,935

PAPER FEED TRACTOR WITH BELT TENSIONING

Wald, Robert D., Harwinton, Conn., assignor to Data Motion, Incorporated, Torrington, Conn.

Filed Sep. 10, 1982, Ser. No. 416,859
Int. Cl.[4] B65H 20/22
U.S. Cl. 226—171 18 Claims

1. In a drive tractor for web material adapted to be mounted on a printer or the like, the combination comprising:

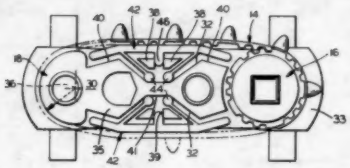
A. a chassis having a pair of spaced transversely extending apertures therein for receiving a pair of shafts of an associated printer or like device, at least one of said apertures being adjacent an end thereof;

B. a flexible endless one-piece belt extending about said chassis in a plane generally perpendicular to the axes of said apertures, said belt defining a closed path of travel thereabout and having an outer driving surface adapted to engage the associated web material and an inner driven surface;

C. a pulley rotatably mounted in said one chassis aperture and in engagement with said driven surface of said belt, said pulley having an aperture therethrough for receiving a drive shaft of an associated printer to effect rotation of said pulley and thereby said belt, the other of said apertures being adapted to receive a support shaft of the associated printer;

D. convexly arcuate belt support means adjacent the end of said chassis spaced from said drive pulley, said belt extending about said support means and pulley and extending in a web drive path therebetween;

E. guide means mounted for reciprocal movement on said chassis between a closed position overlying said web drive path and an open position; and



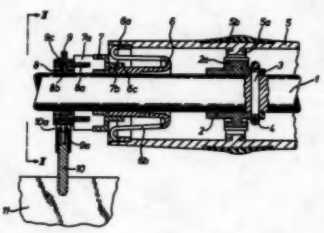
F. belt tensioning means movably supported on said chassis below said belt in the area of said web drive path for resilient deflection in a direction normal thereto, said belt tensioning means being integrally formed with a support plate portion elongated in the direction of said web drive path and having a portion of the length of its upper surface extending parallel to the plane of said web drive path, said surface portion bearing on the lower surface of said belt, said belt tensioning means also including at least one resiliently deflectable leg portion depending therefrom and slidably seated in a cooperating recess in said chassis, said deflectable leg portions normally urging said support plate portion against said belt and thereby said belt against said guide means.

4,638,936

APPARATUS FOR TREATMENT OF WEBS OF PHOTOGRAPHIC MATERIAL

Wolfgang Viehrig; Karl-Heinz Wagner, both of Munich, and Erwin Laar, Valley, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 618,965
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321048
Int. Cl.[4] B65H 20/02, 23/14
U.S. Cl. 226—191 19 Claims



1. In an apparatus for wet treatment of running webs of photographic paper or the like, a driven shaft; a hollow roller normally coaxially surrounding said shaft and having a peripheral surface engageable by a running web; bearing means for radially movably mounting said roller and arranged to offer a

predetermined resistance to radial movement relative to said shaft but to yield when the tension of the running web which contacts the peripheral surface of the roller reaches a preselected value; coupling means engageable to transmit torque from said shaft to said roller in response to radial movement of the roller; and means for braking said roller, including a first braking member arranged to share the rotary movements of said roller and having an annular external surface with a diameter smaller than the diameter of said peripheral surface, a second braking member having an internal surface in frictional engagement with said external surface, and means for preventing rotation of said second braking member so that the first braking member rotates with the roller and relative to said second braking member in response to engagement of said coupling means, said first braking member comprising a first ring which is rotatably mounted on said shaft, and said second braking member including an elastic split ring which surrounds said first ring in prestressed condition so that its internal surface bears against the external surface of said first ring, the internal surface of said split ring bearing against the external surface of said first ring due solely to the elasticity of said split ring, and said split ring having a portion which extends substantially radially outwardly from said first ring and constitutes part of said rotation preventing means, said rotation preventing means further including stop means in abutment with said portion of said split ring.

4,638,937

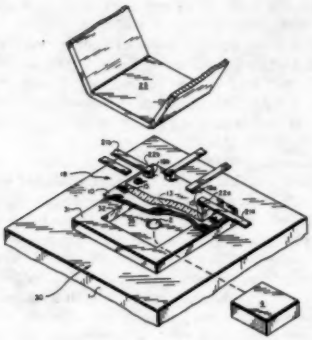
BEAM LEAD BONDING APPARATUS

Thomas D. Belanger, Jr., Clarendon Hills, Ill., assignor to GTE Communication Systems Corporation, Northlake, Ill.

Continuation-in-part of Ser. No. 725,606, Apr. 22, 1985, abandoned. This application Aug. 2, 1985, Ser. No. 761,721

Int. Cl.[4] B23K *37/00*

U.S. Cl. 228—5.5 **8 Claims**



1. A bonding apparatus for bonding a plurality of beam leads each including a bonding end randomly varying in thickness, said bonding ends positioned in relation to other ones of said beam lead bonding ends and positioned to engage a different one of a corresponding plurality of bonding bumps formed on a first side of a substrate, each of said bumps randomly varying in height, said substrate subject to cracking when subjected to a predetermined bonding force and further including a second side, said apparatus comprising:

a bonding element positioned to simultaneously engage said beam lead bonding ends and adapted to apply at least a bonding force to said ends;

a base including a support surface positioned proximate to said substrate second side and adapted to support said substrate;

a compliant pad positioned on said base support surface, said pad compressing in response to the application of bonding force by said bonding element to prevent said bonding ends and bonding bumps from exerting said predetermined bonding force on said substrate and

a protective layer positioned on said pad, wherein said protective layer has an upper surface for directly supporting said substrate and is resistant to laceration by a sharp edge of said substrate and thus protects said pad from laceration.

4,638,938

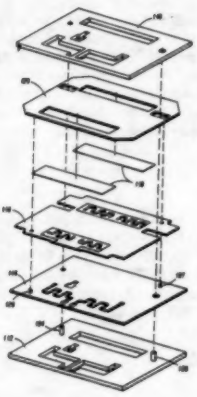
VAPOR PHASE BONDING FOR RF MICROSTRIP LINE CIRCUITS

Andrew J. Yarne, and Eldon F. Burr, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 648,857, Sep. 7, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,215

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—180.1 **3 Claims**



1. A method of forming a stripline circuit assembly comprising the steps of:

a. providing a clamping fixture with at least one vent therein;

b. clamping a workpiece chassis member to a stripline circuit with a solder material therebetween utilizing said clamping fixture; and

c. vapor phase soldering said clamped workpiece chassis member, stripline circuit, and solder, said at least one vent allowing vapor phase soldering gas access to said circuit whereby a high integrity groundplane conduction characteristic is formed.

3. A method of forming a stripline circuit assembly comprising:

a. providing a clamping fixture having a workpiece chassis member and a defined relief clearance area with at least one vent therein;

b. providing a printed circuit board having first and second sides;

c. providing at least one solder form,

d. positioning said first side of said printed circuit board in said defined relief clearance area of said clamping fixture;

e. clamping said printed circuit board to said workpiece chassis member of said clamping fixture with said soldering form therebetween;

f. vapor phase soldering said printed circuit board, said workpiece chassis member, and said solder form; and

g. allowing access to said first side of said printed circuit board through said vent.

4,638,939

METHOD FOR PRODUCING A CLAD PLATE BY ROLLING

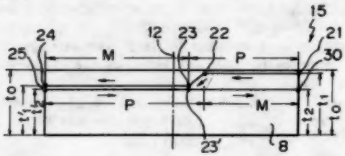
Seishiro Yoshiwara, and Takao Kawanami, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,168

Claims priority, application Japan, Jun. 4, 1983, 58-99988; Jun. 25, 1983, 58-113624; Jun. 25, 1983, 58-113625

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—186 **6 Claims**



1. A method for producing a clad plate by means of hot rolling a cladding assembly having a first welded end and a second welded end and comprising a cladding material and a base material to bond the cladding material with the base material, characterized in that said bonding is effected by main rolling by at least two driven rolls spaced apart at a selected distance, which main rolling is initiated at an essentially central portion of a predetermined bonding surface of the cladding assembly and is advanced toward the first end of the cladding assembly.

4,638,940

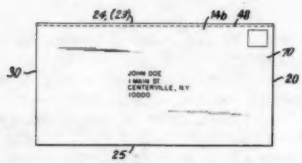
COMBINED FORM FOR VISUAL MATTER, WRITTEN DESCRIPTIONS AND MAILING ENVELOPES

Peter G. Skokos, 902 Fletcher Lake, Bradley Beach, N.J. 07720, and Alvin A. Sobel, 577 Paramus Rd., Paramus, N.J. 07652

Filed Feb. 23, 1983, Ser. No. 469,001

Int. Cl.[4] B65D *27/04, 27/06*

U.S. Cl. 229—92.3 **6 Claims**



1. A business form comprising a single sheet utilizing both surfaces of said sheet and divided essentially into a first panel, a second panel and a third panel, whereby said form could be folded to form a first and a second envelope; said first panel on one surface providing a means for securing visual matter such as photographs or diagrams so that the visual matter would be visible after being secured and on the other surface an envelope face; said second panel on both surfaces providing a space for written descriptions and the third panel on one surface providing a space for written matter and on the other surface an envelope face, wherein said first panel is generally equal in width to the second and third panels and having a front and rear surface, bounded by a top, bottom, free edge and a fold line, said first panel having attached to one surface a see-through plastic sheet equal in dimension to said first panel, said first panel including adhesive strips placed along its four edges and approximately in the middle of said first panel said plastic sheet being attached to the first panel along all adhesive strips except the strip which extends along the free edge to form two compartments which are open along the free edge the adhesive strip on the free-edge of said first panel being covered by a plastic overlay, said plastic overlay preventing adhesion of the see-through plastic sheet on the free edge thereby permitting insertion of visual matter through said free edge, and subsequent removal of said plastic overlay from said adhesive strip on said free edge would permit adhesion of said see-through plastic surface to said sheet forming an enclosed compartment to contain said visual matter, said rear surface being the face of an envelope.

4,638,941

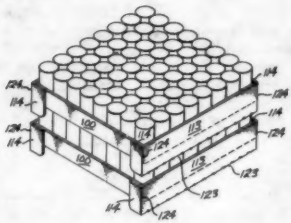
SHIPPING AND DISPLAY CONTAINER

Robert L. Watson, Mt. Vernon, Ohio, assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 28, 1985, Ser. No. 770,825

Int. Cl.[4] B65D *5/22*

U.S. Cl. 229—104 **3 Claims**



1. A shipping and display container comprising;

a base with four linear edges,

a first pair of opposing walls extending from opposing edges of said base to lie below and perpendicular to said base, each of said first pair of opposing walls having a lower edge parallel to said edge of said base,

a second pair of opposing walls extending from remaining opposing edges of said base to lie above and perpendicular to said base, each of said second pair of opposing walls having an upper edge parallel to said edge of said base,

each of said walls extending the entire length of said associated edge of said base,

a panel extending from the entire length of said lower edge of each of said first pair of opposing walls and extending above said base, said panel having an upper edge parallel to said lower edge of said first pair of opposing walls,

means for joining said panels to said second pair of opposing walls, said means comprising a substantially rectangular flap extending from each of the vertical edges of said panels, said flaps being contiguous with an adjacent wall wherein said flaps are joined to said adjacent walls, said flaps extending below said base, whereby said base may act as a base for contents contained therein, and as a cover for contents contained in a second similar container disposed thereunder and said panels and said second pair of opposing walls may surround said contents contained therein and said first pair of opposing walls and said flaps may surround said similar contents contained thereunder.

4,638,942

ADAPTIVE MICROPROCESSOR CONTROL SYSTEM AND METHOD FOR PROVIDING HIGH AND LOW HEATING MODES IN A FURNACE

Gary W. Ballard, Indianapolis, and Robert M. Mamot, Plainfield, both of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 2, 1985, Ser. No. 803,374

Int. Cl.[4] F24D *5/00*

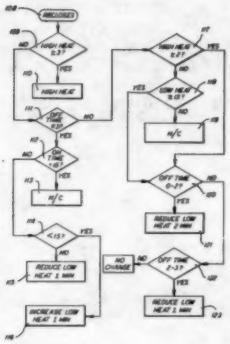
U.S. Cl. 236—10 **18 Claims**

1. A method for selectively providing a low heat mode and

a high heat mode of a heating cycle in a furnace as a function of a previous heating cycle, comprising the steps of:

storing a previous time period of operation of a low heat mode and a previous time period of operation of a high heat mode of a previous heating cycle,

determining the existence of a heating load to be satisfied,



recalling the stored time period of the previous high heat mode,

providing a low heat mode for a selected first time period dependent upon the stored time period of the previous high heat mode, and

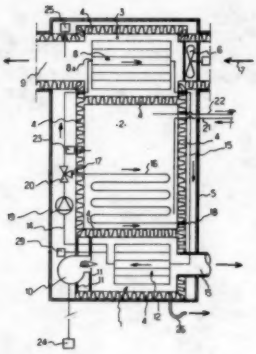
terminating the low heat mode if the heating load is satisfied during the selected first time period.

4,638,943

METHOD OF HEATING ANY BUILDING OR ROOM AND APPARATUS FOR CARRYING OUT THE SAID METHOD

Yves Casier, Ermont; Philippe Cassagne, Paris; Bernard Dore, and Sylvain Gicquel, both of Saint Denis, all of France, assignors to Gaz de France, France

Filed Jul. 18, 1985, Ser. No. 756,455
Claims priority, application France, Jul. 25, 1984, 84 11818
Int. Cl.[4] F24H *3/06*
U.S. Cl. 237—7 **3 Claims**



1. An apparatus for heating a space comprising in combination:

a hot air generator comprising at least one water-air exchanger with high thermal inertia and at least one fan associated with said exchanger for blowing air therethrough into the space to be heated;

a hot water generator comprising a burner and a second exchanger for heat exchange between the water and the combustion products of said burner;

a feed water line and a return water line respectively connecting said second exchanger to said water-air exchanger;

a tank for sanitary hot water;

a circuit extending through said tank for reheating the hot water stored therein, siad circuit communicating, on the one hand, with said feed water line, and, on the other hand, with said return water line; and

an electrovalve provided on said feed line to allow communication of the same with either said reheating circuit or with said water-air exchanger;

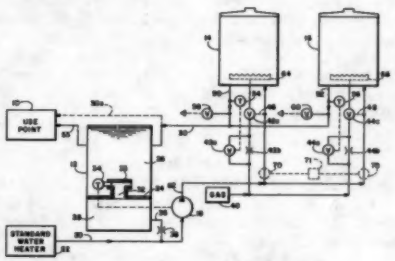
wherein said hot air generator, said storage tank, and said hot water generator are arranged in three heat-insulated tiers combined into a single unit.

4,638,944

COMPACT HIGH VOLUME POINT OF USE INSTANTANEOUS WATER HEATING SYSTEM

Stephen M. Kujawa, 90472 Sheffler Rd., Elmira, Oreg. 97437, and Melvin H. Simon, Box 529, Cottage Grove, Oreg. 97424

Filed Apr. 21, 1986, Ser. No. 853,858
Int. Cl.[4] F24D *3/00*
U.S. Cl. 237—8 R **10 Claims**



1. A fluid heating system comprising:

(a) a fluid source;

(b) a use point for intermittently demanding fluid from said fluid source;

(c) respective first and second instantaneous heater means interposed operatively between said fluid source and said use point for heating fluid from said fluid source substantially instantaneously and delivering it substantially immediately after heating to said use point during periods of demand, each of said heater means having a respective control means for automatically varying the heating performed by the respective heater means in accordance with a respective duty cycle; and

(d) means for causing said control means to operate said first and second heater means at respective duty cycles substantially asynchronous with respect to each other.

4,638,945

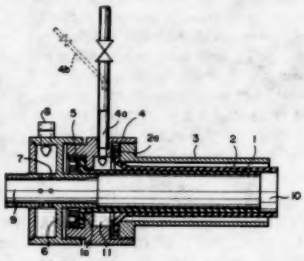
NOZZLE FOR THE GUNNING OF MONOLITHIC REFRACTORIES

Masumi Toda; Yukio Ozaki, and Shingo Nonaka, all of Okayama, Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,227
Claims priority, application Japan, Sep. 1, 1984, 59-132059[U]
Int. Cl.[4] B05B *9/00*
U.S. Cl. 239—143 **1 Claim**

1. In a nozzle for the gunnning of a monolithic refractory, said nozzle comprising means for admixing a gunning material with a liquid and tube means for conveying the admixed liquid

and gunning material through said nozzle to a nozzle outlet, the improvement wherein said tube means comprises a tubular protecting pipe, a flexible outer tube mounted within said protecting pipe, and a flexible inner tube mounted within and substantially coextensive with said flexible outer tube, the outside diameter of said flexible inner tube being as large or slightly larger than as the inside diameter of said outer tube, said flexible outer and inner tubes each being fixed at their ends



disposed towards said admixing means and being free at their opposite ends disposed towards said nozzle outlet, and wherein said nozzle further comprises means for introducing a fluid under pressure between said inner and outer flexible tubes at a location near the ends of the flexible tubes disposed towards said admixing means whereby, in use, the introduced fluid flows between said inner and outer flexible tubes towards the free end thereof to cause said inner and outer tubes to vibrate radially and axially.

4,638,946

VARIABLE CONFIGURATION EXHAUST DISCHARGE OPENING FOR A JET PROPULSION ENGINE

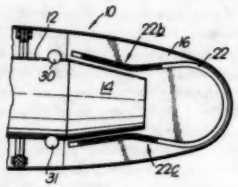
John M. Hall, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 24, 1979, Ser. No. 78,053

Claims priority, application United Kingdom, Oct. 2, 1978, 38936/78

Int. Cl.⁴ F02K *1/09*

U.S. Cl. 239—265.33 **5 Claims**



1. Apparatus for varying the configuration of the final exhaust discharge opening of a gas turbine jet propulsion engine comprising, a jet pipe at the downstream end of the engine and having a rectangular exhaust gas outlet therefrom, track means associated with the downstream end of the engine on both sides of the exhaust gas outlet and extending downstream beyond the exhaust gas outlet, the track means are generally U-shaped and have portions extending above and below the exhaust gas outlet from the jet pipe, said portions being interconnected by a curved portion downstream of the exhaust gas outlet, two flexible deflectors extending between the track means and defining with the exhaust gas outlet a final discharge opening for the engine exhaust gases, one of said deflectors is positioned on top and the other of said deflectors is positioned beneath the exhaust gas outlet from the jet pipe, means for engaging each deflector with the track means on both sides of the exhaust gas outlet and means for moving each deflector along the track means whereby it may be selectively positioned in or out of the exhaust gases leaving the outlet to vary the configuration of the final discharge opening.

4,638,947

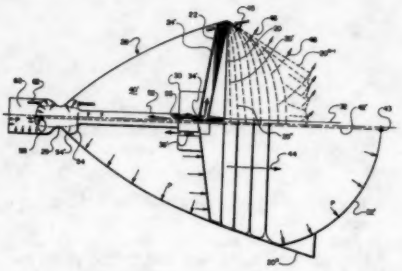
PNEUMATIC BAG DEPLOYMENT OF FOLDED NOZZLE EXTENSIONS

Vance W. Jaqua, Canoga Park, and Premysl Jencek, Chatsworth, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 30, 1985, Ser. No. 781,840

Int. Cl.⁴ F02K *1/08*

U.S. Cl. 239—265.43 **10 Claims**



1. An apparatus for deploying and forming a rocket engine nozzle extension prior to the rocket engine being fired, wherein said nozzle extension is attached to the end of a fixed nozzle and is turned inwardly toward the central axis of said fixed nozzle and folded along pleats so that prior to it being extended said nozzle extension is in a stowed configuration inside said fixed nozzle, comprising:

an inflatable bag within said fixed nozzle wherein prior to the rocket engine being fired said bag is inflated, concurrently unfolding said nozzle extension and pushing said nozzle extension rearwardly away from said fixed nozzle;

means for inflating said inflatable bag; and

means for jettisoning said inflatable bag.

4,638,948

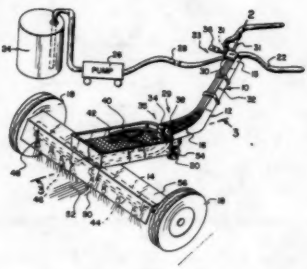
LIQUID CHEMICAL APPLICATOR FOR TREATMENT OF A HORIZONTAL SURFACE

Edward Marlek, 8 Northfield Dr., Ft. Salonga, N.Y. 11768

Filed Feb. 10, 1986, Ser. No. 827,941

Int. Cl.⁴ B05B *15/04, 15/06*

U.S. Cl. 239—722 **4 Claims**



1. A liquid chemical applicator for treatment of a horizontal surface which comprises:

(a) a pair of front wheels;

(b) a frame having an axle, an extension arm and a control handle, said axle extending between said front wheels, said extension arm rearwardly projecting transversely from center of said axle bending upwardly therefrom with, said control handle at distal end of said extension arm;

(c) a rear wheen rotatably connected to bottom of said extension arm rearwardly of said front wheels whereby said rear wheel is manually steered by an operator holding onto said control handle;

(d) means for applying a uniform coating of said liquid chemical onto said horizontal surface from said applicator which is controlled by said operator, said applying means including a drum for holding said liquid chemical therein and a pump fluidly connected to said drum for removing said liquid chemical from said drum and bringing said liquid chemical to said applicator at a desired pressure and means for directing flow of said liquid chemical through said applicator and a pair of manifolds mounted along said axle each of said manifolds having a plurality of spray nozzles and means for controlling pressure of said liquid chemical fluidly connected between said directing means and said spray nozzles of said manifolds so that said spray nozzles will apply a plurality of overlapping sprays of said liquid chemical at a constant height a constant pressure and a proper angle onto said horizonal surface;

(e) a storage basket mounted to top of said extension arm between said front wheels and said rear wheel; and

(f) a wind shield mounted onto said axle over said manifolds to help keep spray pattern constant and prevent said liquid chemical from blowing away.

4,638,949

DEVICE FOR SPRAYING PRODUCTS, MORE ESPECIALLY, PAINTS

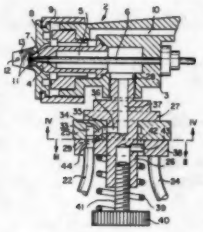
Patrick J. Mancel, 3 rue Lamartine, 78500 Sartrouville, France

Filed Apr. 26, 1984, Ser. No. 603,662

Claims priority, application France, Apr. 27, 1983, 83 06968

Int. Cl.⁴ B05B 7/26

U.S. Cl. 239—307 **3 Claims**



1. A device for spraying a fluid mixture of one or more fluid components, said device comprising:

spray nozzle means comprising (a) a chamber for containing said mixture and (b) an aperture through which said mixture can be sprayed from said device;

a plurality of reservoirs, each for containing a corresponding one of said components;

a plurality of duct means for respectively connecting said plurality of reservoirs to said chamber;

regulating means connected to said duct means between each of said reservoirs and said chamber for selecting the relative amounts of said components provided from said reservoirs through said duct means to said chamber, said regulating means comprising a regulating element mounted for rotation about a rotation axis and including a surface disposed transversely to said axis, said surface having an arcuate-shaped recess extending at least partially around and radially spaced from said axis and adapted to communicate with at least one of said duct means, said recess being flush with said surface at the opposite ends of said recess and of a maximum depth at the middle part of said recess so that the depth of said recess varies such that rotation of said regulating element varies the amount of at least one of said components relative to at least one other of said components provided from the corresponding reservoirs through said recess and at least two of said duct means to said chamber wherein the arcuate length of said recess is such that positioning said regulating element so that one of said duct means communicates with said middle part of said recess, closes the other of said duct means;

needle valve means including a needle disposed in said nozzle means and movable between a first position wherein said needle blocks said aperture and thereby isolates said chamber from said aperture, and a second position wherein said needle is spaced from said aperture so that said chamber is open to said aperture; and

means for coupling said device to a source of pressurized gas so as to propel said mixture from said chamber to said aperture when said needle is disposed in said second position.

4,638,950

APPARATUS FOR APPLYING LIQUID FOR A ROLLING MILL

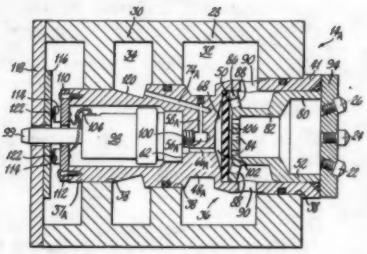
Christopher D. Collinson, and Hugh M. Ross, both of Poole, England, assignors to Davy McKee (Poole) Limited, Dorset, England

Filed Nov. 5, 1984, Ser. No. 668,485

Claims priority, application United Kingdom, Feb. 20, 1984, 8404387

Int. Cl.⁴ B05B 1/14

U.S. Cl. 239—551 **6 Claims**



1. An apparatus for applying liquid for cooling and/or lubricating in a rolling mill comprising:

an elongate bar having a first manifold extending in the direction of its length and connected to a supply of liquid to be applied;

a multiplicity of spray units having associated spray nozzles, each spray unit being supported by the bar and each spray unit having a fluid connection with the first manifold;

each fluid connection having a valve associated therewith whereby the supply of liquid to the spray units can be controlled;

each valve having a diaphragm capable of closing with a first side the fluid connection between the first manifold and the spray unit;

said elongate bar having a second manifold extending in the direction of the length of the bar, and a source of control fluid under pressure connected to the second manifold;

for each valve, a second fluid connection between the second manifold and the other side of the diaphragm in the valve; and

each of said second connections having a respective solenoid operated fluid valve therein to control the flow of control

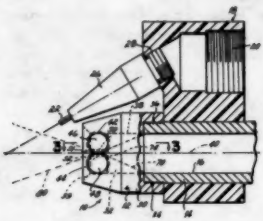
fluid from the second manifold, through said second connection to said other side of the diaphragm of the valve.

4,638,951

ADJUSTABLE POWDER SPRAY NOZZLE

Alexander Gabriel, Northfield, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed May 9, 1985, Ser. No. 732,381
Int. Cl.[4] B05B *1/32, 5/00*
U.S. Cl. 239—707 **8 Claims**



1. An adjustable pattern powder spray nozzle assembly for spraying variable patterns of solid particulate powder material from said assembly of solid particulate powder material from said assembly comprising,

a nozzle body having an axial powder flow passage therein,

a pair of parallel, transverse bores in said body, said transverse bores intersecting said powder flow passage,

a pair of rotatable shafts, one of said rotatable shafts being mounted in each of said transverse bores, said shafts being positioned adjacently one another,

a longitudinally extending slot formed in the periphery of each of said shafts, said slots of said shafts being oppositely positioned so as to form a combined powder flow opening therethrough,

means for rotating said shafts in unison so as to vary the configuration of said powder flow opening and thereby the patterns of powder emitted from said nozzle assembly, and

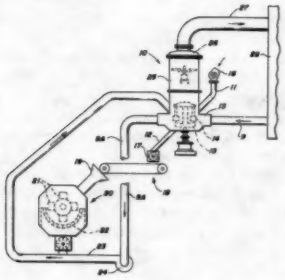
an electrode mount secured adjacent to said nozzle body, said electrode mount having a powder charging electrode extending from the forward end thereof.

4,638,952

METHOD OF FLUID COKE REDUCTION

Robert M. Williams, Ladue, and Robert M. Williams, Jr., Webster Groves, both of Mo., assignors to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Aug. 8, 1985, Ser. No. 763,516
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—3 **4 Claims**



1. A method of reducing spherically shaped pelletized fluid coke waste by-product produced in the refining of petroleum, which method comprises:

(a) feeding the pelletized fluid coke waste into a first stage pulverizing and grinding mill for an initial reduction of such waste, including so much of the pellets as can be reduced;

(b) transporting the unreduced pellets of the fluid coke waste out of the first stage pulverizing and grinding mill into a separate second stage mill for reshaping of the spherical shaped pellets by hammer impact; and

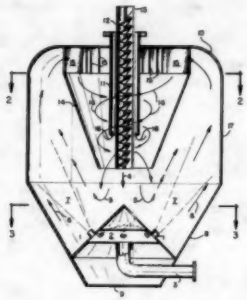
(c) collecting the pellets after being reshaped and returning the collected reshaped pellets to the first stage mill for final pulverization reduction.

4,638,953

CLASSIFIER FOR COMMINUTION OF PULVERULENT MATERIAL BY FLUID ENERGY

David W. Taylor, P.O. Box 67, Edgmont, Pa. 19028

Filed Jul. 19, 1985, Ser. No. 757,825
Int. Cl.[4] B02C *19/06*
U.S. Cl. 241—39 **3 Claims**



1. A fluid energy mill for grinding pulverulent material comprising:

a vertical vessel whose walls are symmetrical about an axis of rotation, a closed bottom at one end and a closed top at the other end of said vessel;

a plurality of nozzles centrally disposed at said bottom so as to discharge fluid carrier medium in a generally axially upward and generally radially outward direction;

a centrifugal classifier axially coincident with said vessel at the top thereof;

inlet guide vanes at the top of said classifier coincident with the top of said vessel to impart rotational flow within said classifier; and

a central axial exhaust and feed in the center of said classifier for feeding pulverulent material into said mill and exhausting ground pulverulent material from said mill.

4,638,954

APPARATUS FOR THE SEPARATION OF MIXTURES OF MATERIALS OF DIFFERENT CONSISTENCIES SUCH AS MEAT AND BONE

Werner Poss, Oakville, Canada, assignor to Poss Design Limited, Hamilton, Canada

Continuation-in-part of Ser. No. 513,487, Jul. 13, 1983, abandoned. This application Jan. 10, 1985, Ser. No. 690,215
Int. Cl.[4] B02C *19/22, 23/16*
U.S. Cl. 241—74 **27 Claims**

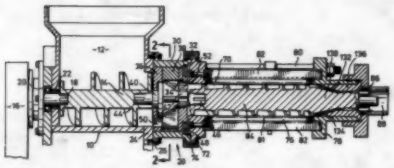
1. Apparatus for the separation of a composite mixture of different materials of different consistencies into separate fractions of the different consistencies comprising:

an apparatus body having an apparatus inlet for the compos-

ite mixture to be separated and respective outlets for the separated fractions,

a rotary vaned pump having a pump compartment mounted by the said body, the pump compartment having an inlet thereto receiving the mixture from the apparatus inlet into the pump compartment and the pump pressurising it in the pump compartment to an operative separation pressure,

said rotary vaned pump having a pump rotor carrying at least one vane rotatable about a rotor axis, said one vane being mounted in a respective radially-extending slot in the rotor and moving radially therein as the rotor rotates, and defining at least two pump chambers in the pump compartment, said pump chambers being formed about a chamber longitudinal axis radially displaced from said rotor axis so that each pump chamber decreases in volume



as the pump vane moves from the pump means inlet toward the pump means outlet and increases in volume as the pump vane moves from the outlet towards the inlet,

separator screen means mounted by the said body against a front face of which the pressurised mixture is delivered for the corresponding softer first fraction thereof to pass through the screen to a rear face thereof and for the remaining second harder fraction to be retained by the screen, and

means connecting at least the front face of the screen to a respective outlet for the respective separated second harder fraction,

said separator screen means and the outlet for the second harder fraction maintaining the pressure of the pressurized mixture at an operative separation pressure.

4,638,955

YARN HANDLING APPARATUS FOR WINDING MACHINE

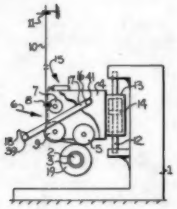
Heinz Schippers, and Erich Lenk, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,902

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411158; Mar. 28, 1984, 3411464; Nov. 12, 1984, 3441250

Int. Cl.[4] B65H *54/02*

U.S. Cl. 242—18 PW **25 Claims**



1. A textile yarn winding machine having a plurality of yarn winding positions aligned along at least one side thereof, and with each winding position comprising

at least one winding spindle adapted for coaxially receiving two or more bobbin tubes,

yarn traversing means for traversing each of a plurality of running yarns along a predetermined yarn traverse stroke to form a cross wound yarn package upon each associated bobbin tube, and

a plurality of yarn handling assemblies operatively associated with each winding position, with each of said yarn handling assemblies being associated with a respective one of said yarns being wound at said position and comprising

(a) yarn catching means,

(b) yarn severing means for severing the running yarn while the yarn is disposed in said yarn catching means, and

(c) yarn suction means for withdrawing the severed yarn end from said yarn catching means, and

means mounting each assembly for movement along a predetermined path of travel between a first end position located on the upstream side of said winding spindle and wherein said yarn catching means is disposed in said predetermined yarn traverse stroke so that the running yarn moves into said yarn catching means where it is adapted to be severed and withdrawn by said severing means and said suction means, and a second end position located on the opposite side of said winding spindle and where the running yarn is adapted to be engaged by a yarn catching and severing notch or the like on the asociated empty bobbin tube mounted on said winding spindle and then again engaged by said yarn traversing means to commence winding of the running yarn upon the empty bobbin tube.

4,638,956

TEXTILE MACHINE FOR PRODUCING CROSS-WOUND BOBBINS

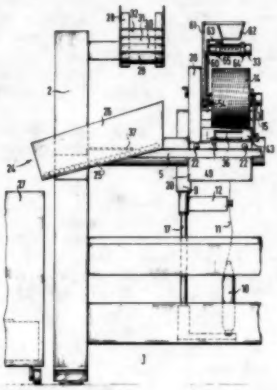
Edmund Wey, Nettetal, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 781,974

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435951

Int. Cl.[4] B65H *54/20, 67/04*

U.S. Cl. 242—35.5 A **4 Claims**



1. Textile machine assembly, comprising a textile machine for producing cross-wound bobbins, said textile machine having a head end, bobbin winding stations and a cross-wound bobbin collector disposed at said head end of said machine; a bobbin changer machine traveling from winding station to winding station for exchanging fully wound individual cross-wound bobbins for empty or partially wound tube sleeves at said winding stations and for transporting individual cross-wound bobbins from said winding stations to said collector; and means disposed at least at one of said machines for causing said bobbin changer machine to transport cross-wound bobbins

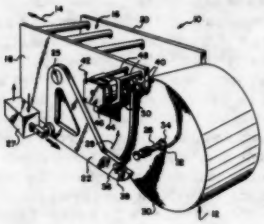
to said collector after each bobbin exchange has occurred and before beginning another bobbin exchange.

4,638,957

BRAKE ENGAGEMENT MECHANISM FOR A WEB PRESS

Gene E. Graves, Centerville, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Oct. 11, 1985, Ser. No. 786,571
Int. Cl.[4] B65H *19/30*; F16H *35/00*
U.S. Cl. 242—58.6 **19 Claims**



11. A mechanism for automatically engaging the roll shaft of an unwind station of a web press with a brake device, said unwind station having a frame, first and second arms pivotally connected thereto, means for raising and lowering said arms, and means disposed on said arms for rotatably supporting said roll shaft, said brake device being secured to said frame and having a brake shaft extending therefrom for driving said brake device, the mechanism comprising:

a first gear connected to said brake shaft;

a second gear connected to said roll shaft such that said second gear is movable, upon raising of said arms, along an arcuate path from a first disengaged position to a second position engaged with said first gear;

a rigid support means pivotally mounted to said brake shaft for pivotal movement about said brake shaft toward and away from said path;

a third gear rotatably mounted on said support means and engaged with said first gear;

a fourth gear rotatably mounted on said support means, engaged with said third gear and adjacent to but not engaged with said first gear; and

means for biasing said support means into a normal position wherein said fourth gear extends partially into said path.

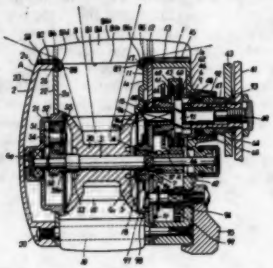
4,638,958

FISHING REEL

Yoshiyuki Furomoto, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 22, 1985, Ser. No. 757,474
Claims priority, application Japan, Jul. 27, 1984, 59-115114[U]
Int. Cl.[4] A01K *89/04*
U.S. Cl. 242—84.1 R **3 Claims**

1. A fishing reel, comprising a reel body having a pair of side frames, a spool disposed between said side frames and supported rotatably to said side frames, a drive mechanism for driving said spool, a clutch means for selectively engaging and disengaging said spool with said drive mechanism, and a guide plate having guide means defining an elongate bore which extends in a same direction as an axis of rotation of said spool, lengthwise ends of said elongate bore being positioned between opposite inner surfaces of said side frames, said guide plate being disposed between said side frames and in front of said spool, said elongate bore comprising curved guide surfaces for guiding line wound onto said spool, said guide plate being rectangular in shape and comprising a pair of lips extending from opposite sides of said guide plate in a direction substantially perpendicular to a plane of said plate, said elongate bore comprising corners which include first ones of said curved guide surfaces for guiding line passing through said elongate bore, said lips having utmost ends in said direction



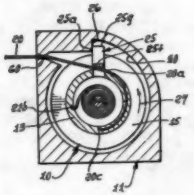
substantially perpendicular to said plane of said guide plate which comprise second ones of said curved guide surfaces for guiding line drawn outwardly from said lips and vertically with respect thereto.

4,638,959

PAWL CONTROLLED REEL EXTENSION

Ralph W. Jones, 1025 Avondale Rd., San Marino, Calif. 91108

Filed Aug. 19, 1985, Ser. No. 766,537
Int. Cl.[4] B65H *75/48*
U.S. Cl. 242—107.4 R **9 Claims**



1. A line dispensing and retracting device, comprising

(a) a reel having a hub about which the line is wound as the reel rotates,

(b) structure mounting the reel for rotation relative thereto, and about an axis,

(c) a generally radially movable element carried by the reel to move between an inwardly retracted position in which the reel is free to rotate, and an outwardly extended position in which the movable element prevents further dispensing of the line,

(d) and the line wound on the reel in operative relation with the movable element to control said element's movement in response to reel rotation,

(e) said line including an inner winding extending sufficiently beneath said element as to urge the element outwardly relative to the reel in response to reel rotation in a line dispensing direction.

4,638,960

METHOD AND APPARATUS FOR DETERMINING ICE BOUNDARY TEMPERATURE FOR THE DE-ICING SYSTEM OF AN AIRCRAFT

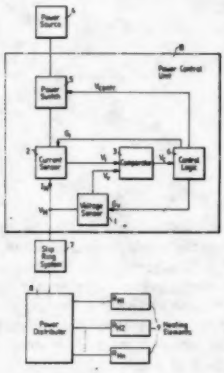
Axel Straube, Uetersen, and Hans Loos, Holm, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,505

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437304

Int. Cl.[4] B64D *15/12*

U.S. Cl. 244—134 D 14 Claims



9. An apparatus for determining the temperature of a resistive heating element having a temperature coefficient, comprising:

at least one resistive heating element;

a power supply connectable to said heating element for supplying a powering voltage and powering current to said heating element;

a controllable power switch connected between said power supply and said heating element for interrupting voltage and current supplied to said heating element;

a voltage sensor connected to said heating element for generating a voltage signal which is proportional to an instantaneous voltage supplied by said power supply to said heating element;

a current sensor connected to said heating element for generating a current signal which is proportional to instantaneous current supplied to said heating element by said power supply;

a comparator connected to said voltage and current sensors for comparing said voltage and current signals and for generating a difference signal corresponding to a difference between said voltage signal and said current signal; and

logic means including a predetermined switch threshold, said switching threshold corresponding to a desired temperature of said heating element, said difference signal corresponding to said switching threshold when said heating element reaches the desired temperature.

4,638,961

MANEUVERABLE PARACHUTE

Jacques R. Rousseau, Epinay-sur-Orge, France, assignor to Aerazur-Efa, Issy-les-Moulineaux, France

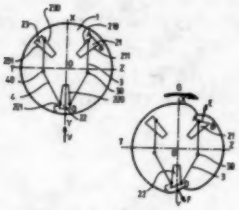
Filed Jul. 30, 1984, Ser. No. 636,026

Claims priority, application France, Mar. 30, 1984, 84 05099

Int. Cl.[4] B64D *17/00*

U.S. Cl. 244—142 4 Claims

4. A process for controlling a maneuverable parachute operable by a parachutist, said parachute comprising a canopy having a plurality of gores, said canopy comprising at least three maneuvering windows distributed over the canopy about a vertical main plane of symmetry perpendicular to a line through shoulders of the parachutist, two of said windows being situated in front of said line, each window having two opposite edges essentially parallel to the gores of the canopy, and at least two maneuver control means, each of said means comprising a control handle and line means having a first and second end, said first end being connected to an edge of a window and said second end being connected to a non-neighboring edge of a second window, the said two non-neighboring edges being situated on the same side of the main plane of



symmetry, said process comprising applying traction by the parachutist to a single control means for effecting a rotation of the parachute in the direction corresponding to the side on which the control means is situated in relation to the main plane of symmetry, applying traction by the parachutist to a pair of control means situated on the same side in relation to the main plane of symmetry for effecting a lateral displacement of the parachute, and applying traction by the parachutist to a pair of control means situated one on each side of the main plane of symmetry for effecting an axial displacement of the parachute.

4,638,962

JUMBO AIRCRAFT, IN PARTICULAR OF HIGH-WING MONOPLANE DESIGN

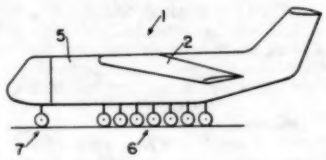
Heinz Günter, Friedrichshafen; Gerhard Kriechbaum, Markdorf; Hubert Krojer, Bermatingen; Rudolf Matecki, Markdorf, and Johannes Spintzyk, Friedrichshafen, all of Fed. Rep. of Germany, assignors to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,548

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924742

Int. Cl.[4] B64C *13/16, 25/04*

U.S. Cl. 244—203 3 Claims



1. In a jumbo aircraft, in particular of high-wing monoplane design, with a fuselage and a retractable and steerable main landing gear and means for high lift generation, the improvement comprising:

(a) a plurality of rows of landing gear units mounted along the aircraft fuselage and spread across a range extending predominantly in the longitudinal aircraft direction, the number of said landing gear units extending in the longitudinal aircraft direction being a multiple of the number of landing gear units mounted in the direction of the aircraft transverse axis, said units forming said main landing gear.

(b) said landing gear units being of the same design and identical dimensions,

(c) means for switching-on the lift generating means at predetermined lift conditions, together with setting and maintaining a longitudinal attitude of the aircraft or of its landing gear parallel to the taxiway and runway, whereby the take-off phase or the landing phase is performed using the method of direct lift control; and

in which the actuation of the lift generating means is implemented as a function of the predetermined magnitudes of the landing gear loads.

4,638,963

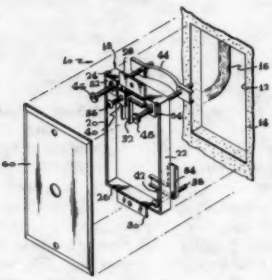
ELECTRICAL WALL BRACKET

Jose L. Hernandez, 9940 La Tuna Canyon Rd., Sun Valley, Calif. 91352

Filed May 17, 1985, Ser. No. 735,449

Int. Cl.[4] F16L *5/00*

U.S. Cl. 248—56 **18 Claims**



1. An electrical wall bracket comprising:

a substantially rectangular frame having an open interior and having at least one boss directed toward the interior thereof, said boss having an opening therein;

means on said frame for securing said frame at least partially within an opening in wall board; and

a cable clamp mounted on said frame, said cable clamp comprising a clamp for engagement with the cable and at least one machine screw engaged through said opening in said boss and engaging said clamp so as to adjustably secure said clamp with respect to said frame for securing the cable with respect to the opening in the wall board so that the cable can be located and drawn through the opening in the wall board.

4,638,964

GROMMET ASSEMBLY

David K. Sovacool, Cortland; Allan S. Van Slyke, Southington, and Edward M. Bungo, Cortland, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1985, Ser. No. 796,198

Int. Cl.[4] F16L *5/00*

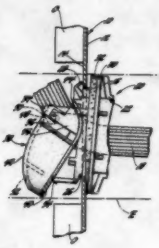
U.S. Cl. 248—56 **3 Claims**

1. A grommet assembly for passing a wire bundle through an aperture in a panel having opposed surfaces, said assembly being attachable to said panel within a limited access space around said aperture, comprising,

a grommet body having a passage through which a wire bundle may extend, said grommet body also having a stop portion that is engageable with one surface of said panel when said grommet body is placed in an attachment position overlying said aperture with said wire bundle passing through said aperture, said grommet body having a periphery defining, when in said attachment position, an attachment envelope within said limited access space,

a pivot support extending from said grommet body and offset to one side thereof while still being able to pass through said aperture as said grommet body is placed in said attachment position,

a retainer including at least one pivot member by which said retainer may be pivotally joined to said pivot support when said grommet body is in said attachment position so as to be rotatable toward said grommet body, said retainer further including a stop portion that is engageable with said panel other surface as said retainer rotates to an operative position, said retainer further being sized so as to remain substantially within said attachment envelope as said retainer rotates to said operative position, and locking means maintaining said retainer at said operative rotated position with said grommet body and said retainer stop portion engaged with their respective panel surfaces, whereby said grommet assembly is attached to said panel within said limited access space.



4,638,965

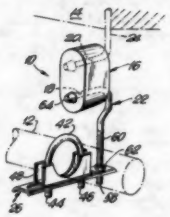
UNIVERSAL BRACKET ASSEMBLY

Mark De Bruine, Temperance, and Kenneth Spotts, Dundee, both of Mich., assignors to AP Industries, Inc., Toledo, Ohio

Filed Oct. 3, 1985, Ser. No. 783,828

Int. Cl.[4] E21F *17/02*

U.S. Cl. 248—59 **5 Claims**



1. A universal mounting bracket assembly for mounting an exhaust pipe to a vehicle, said assembly comprising:

an elongated support plate having opposed first and second ends and a pair of support rails extending along opposed sides thereof between the first and second ends, said elongated support plate further including a circular aperture generally adjacent to the first end and a pair of elongated cut outs disposed intermediate the circular aperture and the second end of said elongated support plate, said elongated cut outs and said circular aperture being generally collinearly with one another;

a support base mounted to said elongated support plate adjacent the elongated cut outs therein, said support base including an arcuate support surface for engaging the pipe;

a U-bolt dimensioned to engage the pipe, said U-bolt including a pair of generally parallel threaded ends, said

threaded ends of said U-bolt extending through said support base and through the elongated cut outs of said support plate;

a pair of clamping nuts threadably mounted to the ends of said U-bolt;

a formed support rod having opposed first and second ends and being characterized by an array of external threads extending from the first end thereof to a point intermediate said first and second ends, said second end of said formed support rod being mountable to the vehicle, the first end of said formed support rod extending through said circular aperture in said elongated support plate;

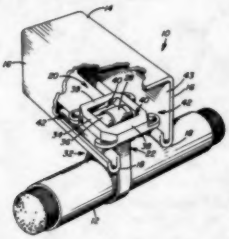
first and second support nuts threadably mounted to said formed support rod, said first and second support nuts being disposed on opposite sides of said elongated support plate, whereby the U-bolt and the formed support rod can be moved relative to the elongated support plate to effect the secure adjustable mounting of the pipe to the vehicle.

4,638,966

SUPPORT MEMBER FOR HANGING CABLE

James H. Ford, Pittsburgh, Pa., assignor to Robroy Industries, Verona, Pa.

Filed Jun. 21, 1985, Ser. No. 748,191
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—62 **27 Claims**



1. Cable supporting structure comprising:

a longitudinally extending channel-shaped support structure, said support structure including a pair of spaced side walls having free end portions turned inwardly to form opposed longitudinally extending flanges;

locking strip means capable of extending around cable means for securing said cable means to said support structure, said locking strip means including opposite portions and an intermediate portion therebetween;

a support member positioned within said support structure to extend between said flanges with opposite ends of said support member respectively supported by said flanges;

said support member including slotted means for receiving said locking strip means to extend around a central body portion of said support member in overlying relation with said body portion;

said support member including integral resiliently deflectable biasing means extending from at least one of said opposite ends for producing frictional contact betewen said support member and said side walls tending to resist movement of said support member within said support structure; and

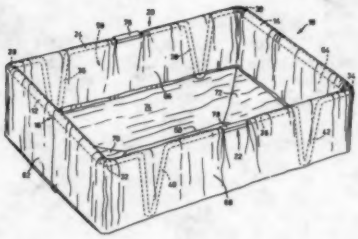
means associated with said locking strip menas for connecting said opposite end portions to form a loop of a preselected size extending around said body portion of said support member at said intermediate portion and around said cable means at the connected said opposite end portions to support said cable means against said support structure.

4,638,967

COLLAPSIBLE SUPPORT FRAME WITH RECEPTACLE

Richard J. MacDuffee, R.R. #1, Palgrave, Ontario, Canada

Filed Apr. 23, 1985, Ser. No. 726,401
Int. Cl.[4] A63B *55/04*
U.S. Cl. 248—97 **14 Claims**



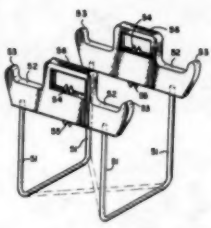
1. A collapsible support frame with receptacle wherein said frame is of generally rectilinear configuration including opposed spaced apart front and rear frame portions connected together with opposed spaced apart side frame portions, said side frame portions in the regions of the opposed spaced apart front and rear frame portions respectively presenting downwardly projecting surface engaging formations of like extent, said receptacle including opposed front and rear panels and opposed side panels terminating lowermost in a bottom panel and having a perimetral extent so as to be disposable within said collapsible support frame, said opposed front and rear panels and said opposed side panels of said receptacle having a vertical extent exceeding that of said downwardly projecting surface engaging formations of said collapsible support frame and a perimetral extent such that when said opposed front and rear panels and said opposed side panels are folded over the opposed spaced apart front and rear frame portions and opposed spaced apart side frame portions respectively of said collapsible support frame said front and rear frame portions and said side frame portions are constrained against separation.

4,638,968

RUBBISH CONTAINER

Howard L. Auten, Manapapan, Fla., assignor to Auten & Auten, Inc., Lantana, Fla.

Filed Aug. 22, 1984, Ser. No. 643,047
Int. Cl.[4] B65B *67/04*
U.S. Cl. 248—97 **2 Claims**



1. A bag holding structure, comprising:

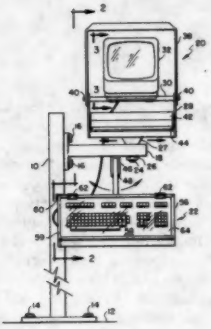
two parallel, relatively wide cross bars having an open inverted U-shaped handle extending upwardly between upturned end retaining shoulders.

two upright U-shaped support members having ends, each end being rotatably attached to a separate one of said two cross bars; and,

within said handle openings and also extending downwardly from said cross bar below said handles, projections ex-

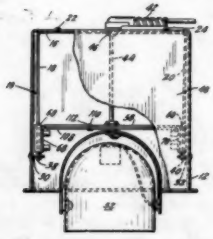
tending upwardly from said cross bar whereby bag material can be laid over said handles, and through said handle openings to be engageable on said projections and whereby said structure can be collapsible when not in use as permitted by the rotatable securement of said support members to said cross bars.

4,638,969
VIDEO DISPLAY ARRANGEMENT
Walter J. Brown, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed Dec. 24, 1984, Ser. No. 686,138
Int. Cl.[4] F16L *3/00*
U.S. Cl. 248—122 **11 Claims**



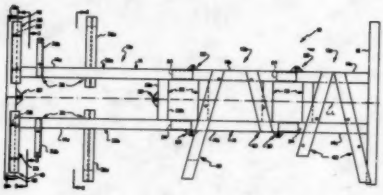
1. A support arrangement for mounting a video screen and a key board in a manufacturing environment comprising: a vertical support member, a second support member mounted to and substantially perpendicular to said vertical support member, a first casing horizontally, adjustably supported above and by said second support member, a rotatably adjusted bar member support in said first casing, a video screen attached to said bar member, means mounting a key board casing horizontally and adjustably below and to said second support member, said means including a second means to allow vertical rotation of said key board casing and a key board slidably mounted in said casing.

4,638,970
HIGH HAT LIGHT FIXTURE SUPPORT BRACKET
Gerard Phelan, Stony Point, N.Y., assignor to Swiveller, Nanuet, N.Y.
Filed Aug. 12, 1985, Ser. No. 764,569
Int. Cl.[4] B42F *13/00*
U.S. Cl. 248—342 **11 Claims**



1. A height adjustable light fixture support comprising:
a first generally U-shaped bracket having a first crosspiece and first and second legs depending from the first crosspiece;
a second generally U-shaped bracket, including first and second plates each shaped to define a respective sliding channel in which a respective one of the legs of the first U-shaped bracket is slidingly receivable; a second crosspiece extending between the plates for connecting the plates to one another;
a spring loaded biased member for each plate, the biased member being biased to penetrate into the sliding channel of the plate and to press against the respective leg of the first U-shaped bracket when the leg is inserted into the channel to thereby frictionally secure the plate and the leg to one another.

4,638,971
MACHINERY SKID
Michael J. Basinsky, Broken Arrow; Dale T. Bird, Bristow, and Daniel W. Smith, Tulsa, all of Okla., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.
Filed Feb. 4, 1986, Ser. No. 825,824
Int. Cl.[4] F16M *3/00*
U.S. Cl. 248—678 **20 Claims**



1. A machinery skid comprising:
a modular frame assembly having first and second longitudinally interlockable sections;
engageable means for securing said sections together, said sections when assembled defining two relatively close longitudinal support members and a plurality of transverse support members, each longitudinal member having at least two segments joinable together in endwise alignment by said securing means, said first interlockable section having certain of said transverse members being fixedly secured to both longitudinal members and extending outwardly therefrom, said second interlockable section having other said transverse members only being fixedly secured to respective ones of said longitudinal members and extending outwardly therefrom, a pair of said other transverse members being positioned on respective free ends of said longitudinal members at one end of said second interlocking section, said pair of transverse members being joinable by said securing means such that one end of the skid is formed by said second interlocking section which can be disassembled from the skid in two laterally separate parts.

4,638,972
VALVE APPARATUS
Marvin R. Jones, and Paul E. Helfer, both of Houston, Tex., assignors to Koomey, Houston, Tex.
Filed Jul. 18, 1985, Ser. No. 756,187
Int. Cl.[4] E21B *33/06*
U.S. Cl. 251—1.3 **9 Claims**

1. A blowout preventer, comprising
a housing having a bore therethrough and chambers which intersect the bore,
rams reciprocable within the chambers between positions for opening the bore and positions engaged with one

another for closing the bore to divide it into zones above and below the rams,

means for so reciprocating each ram including a rod which extends sealably through the housing into the chamber and is connected to the ram for moving the ram inwardly with the rod to closed position and outwardly with the rod to open position,

first and second passageway means for connecting the upper and lower zones of the bore, respectively, with the chamber behind at least one ram when the rams are closed,

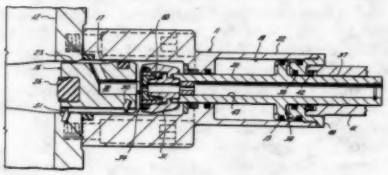
one of the passageway means extending through the one ram,

the connection of said one ram to its rod having lost motion, and

the rod for said one ram having a packing assembly thereon comprising

inner and outer metal rings which are carried by the inner end of the rod for axial movement with respect thereto and whose inner ends protrude from the surrounding end surface of the inner end of the rod, and

a ring of elastomeric material having its inner and outer diameters and outer end confined between said metal rings and by a recess in the inner end of the rod,



the inner diameter of the elastomeric ring subtending an area greater than that of the portion of the rod which extends sealably through the housing,

said elastomeric ring having an annular ridge on its inner end which protrudes from the adjacent end surfaces of the inner and outer metal rings, for sealable engagement with and disengagement from an end surface of the ram which surrounds the opening of the one passageway means into the chamber, in response to outward and inward movement of the rod, respectively,

the inner end of said packing assembly having an annular recess which surrounds the ridge and into which a volume of elastomeric material equivalent to that of the ridge may move as the ridge is deformed upon inward movement of the rod, and

the radially inner side of the end surface of the ridge being generally frusto-conically shaped, so that as the ridge first engages the end surface of the ram, well fluid in the chamber acts over an area subtended by the outer diameter of said surface, and then, as the pressure of the well fluid increases, over successively smaller areas.

4,638,973

INLINE SOLENOID OPERATED SLIDE VALVE

Robert J. Torrence, Addison, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 14, 1985, Ser. No. 798,100
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.02 **4 Claims**

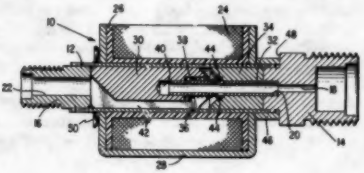
1. An electrically operated fluid flow control valve, comprising:

a hollow cylindrical valve sleeve;

a pair of fittings fixedly mounted one on each end of said valve sleeve for coupling the valve into a fluid flow line, said fittings each having an internal fluid flow conduit, a first of said fittings having a counter bore extending part way into the conduit of said first fitting from the end of said first fitting which is mounted on said valve sleeve;

an electrical coil surrounding said valve sleeve between said fittings;

a magnetic pole piece fixedly secured within said valve sleeve and extending from the second of said fittings inside the region defined by said coil, said pole piece have a stepped counterbore extending part way into said pole piece from the end of said pole piece remote from said second fitting, said pole piece further having a longitudinal exterior channel extending the length of said pole piece, said channel intersecting the open end of said coun-



terbore and communicating with the conduit of said second fitting;

a hollow tube member secured at one end in the counterbore of said first fitting and at the other end extending into the small step of the counter bore of said pole piece, said tube member having a valve port in its wall;

a magnetic plunger surrounding said tube member and slideable thereon to selectively cover and expose said valve port; and

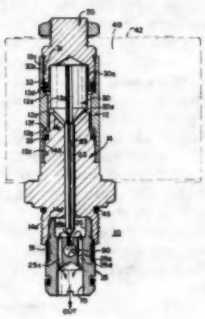
spring means for yieldably biasing said plunger away from said pole piece.

4,638,974

ELECTROHYDRAULIC VALVE ASSEMBLIES AND METHOD

Kenneth W. Zeuner, 43 Red Fox Dr., New Hope, Pa. 18938; Steven K. Zeuner, 39 Larch Cir., and Thomas A. Zeuner, 230 Woodlake Dr., both of Holland, Pa. 18966

Filed Jan. 6, 1984, Ser. No. 568,599
Int. Cl.[4] F16K *31/02*
U.S. Cl. 251—129.15 **11 Claims**



1. A solenoid operated valve assembly having an armature comprising

a body section having high magnetically permeable material and having an upper threaded portion,

an end stop section having high magnetically permeable material and having a lower threaded portion,

an orifice assembly for controlling flow of fluid being secured to the body section,

plug means engaging the armature and movable between a valve closed state with the plug means seating in and closing the orifice assembly and a valve open state,

a unitary sleeve section of low magnetically permeable material having an inner chamber with upper and lower portions, upper and lower portions have internally threaded upper and lower threaded sections which are adapted to threadedly engage the threaded portion of the end stop section and the upper threaded portion of the body section, respectively, means for fluidly sealing the upper and lower portions with respect to the end stop section and the body section, respectively,

an internal pressure chamber for housing the armature formed by the end stop section, the inner chamber of the sleeve section and the body section and the body section in fluid communication with the orifice assembly whereby the sleeve section is of sufficient strength to withstand the pressure of the fluid within the inner chamber of the sleeve section, and

means for producing and concentrating magnetic flux flow through the end stop section, the armature and the body section for moving the armature and the plug means.

4,638,975

FLUID COUPLER

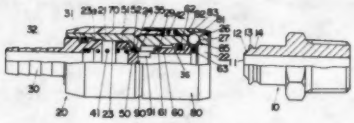
Akira Iuchi, Kobe, and Shinya Tsunokawa, Osaka, both of Japan, assignors to Osaka Gas Company Limited, Higashi, Japan

Filed Jul. 27, 1984, Ser. No. 635,023

Claims priority, application Japan, Jul. 30, 1983, 58-118978[U]

Int. Cl.[4] F16L *37/28*

U.S. Cl. 251—149.6 **7 Claims**



1. In a fluid coupler having a female coupling member with an incorporated valve and a male coupling member for connection to the female coupling member for opening the valve to start a fluid flow therebetween, the combination comprising:

a generally cylindrical main body constituting said female coupling member and shaped to have an axial bore with front and rear openings at its axial ends, said cylindrical main body being provided intermediate the axial ends with an annular flange projecting inwardly thereof to define a valve seat;

a valve member slidably received within the main body to be movable in the axial direction thereof, said valve member including a head portion having an outside diameter greater than the inside diameter of said internal annular flange and located on the rear side thereof so as to be cooperaive with said valve seat to define said valve, said head portion of the valve member being shaped to define a fluid passage between its outer peripheral portion and the inner surface of the main body at the portion rearwardly of said internal annular flange when it is in an open position;

a connection plug fitted in the rear opening of the main body for connection of the female coupling member with a source of fluid;

a compression spring interposed between the valve member and the connection plug so as to bias the valve member into a closed position where the head portion of the valve member is in sealing contact with the valve seat;

a turbular member slidably received within the main body forwardly of the valve member so as to be movable therewith, said tubuiar member being provided at its front end with first sealing means adapted to be brought into sealing contact with the male coupling member to be inserted within the front opening of the main body and being provided around its periphery with second sealing means which projects outwardly therefrom so as to be brought into sealing contract with the inner surface of the main body when the valve member is in the open position;

a thrust member operatively interconnecting the valve member and the tubular member such that when the male coupling member is inserted in the female coupling the tubular member will be forced thereby to thrust the valve member so as to move it against the biasing force of the compression spring into an open position, said thrust member arranged substantially not to prevent fluid flow from the valve into the tubular member when the valve is opened; and

locking means to lock the male and female coulping members at a connecting position where the male member is slid into the female member by a certain distance enough to open the valve as well as ensure sealing contact between the front end of the tubular member and inlet end of the male coupling member;

said valve member having a sealing ring in sealing contact with the valve seat on the rear wall of said annular flange, said sealing ring being fitted around a reduced-in-diameter section of said valve member extending forwardly from the head portion at the juncture between the reduced-in-diameter section and the head portion of a larger diameter;

said sealing ring being fitted around said reduced-in-diameter section with its outer periphery projecting radially outwardly of the head portion of said valve member, said main body being provided on its cylindrical inner surface with an exially elongated and radially reduced platform which extends rearwardly from said annular flange by a limited distance, said platform having a diameter substantially uniformly along its length which is larger than the inside diameter of the annular flange but smaller than the remaining rear portion of the main body such that the sealing ring is kept in sealing contact with the platform to close the valve while it is moved together with the valve member within the axial length of the platform and is out of sealing contact with the platform to open the valve when it is moved together with the valve member rearwardly beyond the rear end of the platform, and said axial length of the platform being long enough to allow the valve member to compress the spring sufficiently for developing a secure sealing contact between the male coupling member and the tubular member before the valve member is forced by the male coupling member to move further rearwardly with the sealing ring into the open positon.

4,638,976

ROTARY GATE VALVE GASKET AND PROCESS FOR ITS MANUFACTURE

Robert Souplet, Nancy, and Jean Sutter, Villers les Nancy, both of France, assignors to Pont-a-Mousson S.A., France

Filed Jun. 24, 1985, Ser. No. 748,062

Claims priority, application France, Jun. 27, 1984, 84 10289

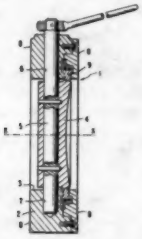
Int. Cl.[4] F16K *25/00*

U.S. Cl. 251—173 **8 Claims**

1. A gasket for a valve (1) having a body (2) surrounding an axial fluid flow channel (3) with an axis X—X, a rotary gate (4) mounted within the body (2) on a shaft (5), and adapted to rotate between a channel open and channel closed position, the body having a first contoured surface formed in one face thereof, and an annular retaining ring (11) disposed coaxial with the body and having a shaped surface adapted to form a groove (10) when mated with the body, the groove having a wide portion (10*a*) opening into the axial channel (3) and a first narrow portion (10*b*), said gasket comprising:

a solid portion (15) in the shape of a circular ring having the axis X—X and a coaxial annular flange portion (16) contiguous with said solid portion and having a first and a second member (29, 30) extending outwardly from the solid portion and configured, when adjacent to each other, to fit tightly within said groove, an elastic ring (28)

having a substantially rectangular cross section for bearing said solid portion against the valve gate when in a channel closed position, said ring being housed within a closed chamber defined by said solid portion and said first and second contiguous members, said chamber having two first surfaces (24, 25) parallel to axis X—X and two parallel second surfaces (26, 27) perpendicular to said first surface,



said gasket solid portion (15) and flange portion (16) being made of a fluorocarbon polymer material that can be used in a corrosive environment after sintering,

whereby said gasket may be used with corrosive fluids, provides substantially axially sized support and is adapted to withstand both upstream and downstream pressures.

4,638,977

VALVE ACTUATOR

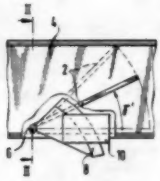
Georg Vonhausen, Nauheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1985, Ser. No. 792,192

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429660

Int. Cl.[4] F16K *31/53*

U.S. Cl. 251—248 **2 Claims**



1. Arrangement for actuating a control valve for mixed air heating systems in motor vehicles and the like comprising a non-shiftable spur wheel connected to a shaft that extends approximately at right angles to a rotatable shaft that is connected to the valve, a crown-wheel segment connected to said valve shaft having teeth continuously meshing with the spur wheel characterized by the teeth on the crown wheel segment having a pitch that decreases and/or increases in the direction of opening of the valve to thereby decrease and/or increase the rate of opening of the valve always within a full revolution of the spur wheel in either direction thereof and always retaining said continuous meshing.

4,638,978

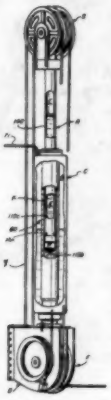
HYDROPNEUMATIC CABLE TENSIONER

Larry B. Jordan, 10710 Archmont St., Houston, Tex. 77070

Continuation-in-part of Ser. No. 516,102, Jul. 22, 1983, Pat. No. 4,540,159. This application Aug. 1, 1985, Ser. No. 761,585

Int. Cl.[4] B25B *25/00*; B66D *1/50*

U.S. Cl. 254—228 **8 Claims**



1. A hydropneumatic cable tensioner comprising:

a base;

a cylinder mounted on said base, said cylinder comprising an accumulator chamber and a piston bore chamber;

a first enclosure means for enclosing a first end of said cylinder;

a first cable sheave mounted to said first enclosure means;

a second enclosure means for enclosing a second end of said cylinder;

a piston rod comprising a first end extending within said piston bore chamber and a second end extending outside said cylinder through said second enclosure means, wherein said first end of said piston rod has a reduced diameter piston mounting section which forms a shoulder on said piston rod;

a second cable sheave mounted on said second end of said piston rod;

a piston comprising a conical frustum shaped support bushing removably fitted onto said reduced diameter piston mounting section and butted up to said shoulder on said piston rod, wherein said piston is reciprocable within said piston bore chamber;

a piston sealing means which in cooperation with said piston divides said piston bore chamber into a low pressure segment above said piston sealing means and a high pressure segment below said piston sealing means;

a first ported restriction means comprising a port communicating between said piston bore chamber and said accumulator chamber for controlling oil flow between said piston bore and accumulation chambers thereby limiting piston velocity in the event of a sudden change in cable tension, said piston bore chamber being ported to said accumulator chamber between said first closure means and said piston when said piston is fully retracted within said piston bore chamber proximate said first closure means;

a containment chamber within said piston rod for containing an initial charge of gas and oil;

a second ported restriction means comprising a port communicating between said piston bore chamber and said containment chamber for controlling oil flow between said piston bore and containment chambers thereby limiting piston velocity in the event of a sudden change of cable tension, said port being adjacent said piston;

an annular ring fitted within said piston bore chamber adjacent said second closure means having an inner face positioned around said piston rod adapted to receive said piston to prevent further movement of said piston toward said second closure means; and

means for regulating the pressure within said accumulator chamber to regulate the pressure exerted on said piston to thereby control the movement of said piston and piston rod and the force applied thereby.

4,638,979

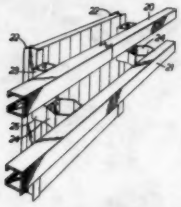
VEHICLE CRASH BARRIERS

Vincent M. Demarest, Ipsden, Wallingford, Oxfordshire, Great Britain OX9 6BS

Filed Mar. 29, 1985, Ser. No. 717,689

Int. Cl.[4] A01K *3/00*; E01F *15/00*

U.S. Cl. 256—13.1 8 Claims



1. A vehicle crash barrier comprising a series of upright posts, a generally horizontal beam construction comprising two separate rails supported on said posts one above the other, and deformable connections between said rails and said posts, the connections to one of said rails being relatively stiff while the connections to the other rail are more easily deformable, thus providing a progressively increasing resistance to impact by a vehicle on the beam construction.

4,638,980

APPARATUS AND METHOD FOR MAINTAINING THE TEMPERATURE OF MOLTEN METAL

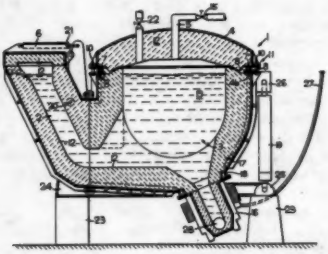
Günther Beele, Kerpen-Blatzheim, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 836,095

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507648

Int. Cl.[4] C21C *7/10*

U.S. Cl. 266—44 14 Claims



1. Apparatus for storing and maintaining a predetermined temperature level of a nodular cast iron melt which has been treated with magnesium, comprising: a heatable furnace chamber having a main part with an inner cavity for holding the major part of the melt and a combined inlet and outlet part secured to the main part, a chamber cover for the main part, a pressure sealing arrangement between said chamber cover and said main part, a closing cover in pressure sealed relation with said inlet and outlet part, and an inlet in said apparatus for delivering a medium under pressure to said cavity of said furnace chamber whereby the latter is maintained at a predetermined pressure greater than atmospheric pressure to prevent disintegration of the magnesium in said melt.

4,638,981

ENGINE MOUNT

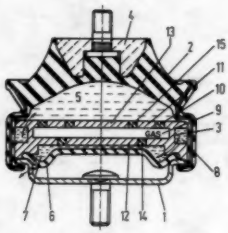
Giacomo Sciortino, Heidelberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,419

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501112

Int. Cl.[4] B60G *13/00*; F16M *13/00*

U.S. Cl. 267—8 R 4 Claims



1. A hydraulically damped engine mount comprising:

a mounting bracket;

a supporting spring and a partition wall bounding a working space;

a resilient buffer wall, the resilient buffer wall and the partition wall bounding an equalizing space, the working space and the equalizing space being interconnected through a throttle opening;

a liquid filling the working space and the equalizing space;

a gas-filled chamber which is disposed within the partition wall; and

a disk suspended from the partition wall and closing the chamber, said disk being a chain vibrator comprising at least two successive, radially interposed neutralizing masses and annular diaphragms for elastically securing said neutralizing masses to each other and to the partition wall.

4,638,982

VEHICLE SEAT MONITORING MEANS

Hans-Peter Misher, Bad Meinberg, and Helge Pietsch, Detmold, both of Fed. Rep. of Germany, assignors to Gebr. Isringhausen, Lemgo, Fed. Rep. of Germany

Filed Apr. 3, 1984, Ser. No. 596,252

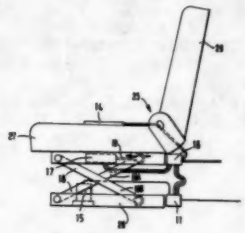
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312732

Int. Cl.[4] A47C *7/14*; F16M *13/00*

U.S. Cl. 267—131 9 Claims

1. A vehicle seat monitoring means for an assembly that includes a vehicle seat, a base member, linkage means mounted on said base member and interconnected to said vehicle seat for effecting vertical movement thereof, a pneumatic spring engaging said linkage means for controlling the movement thereof and providing a resilient support for said vehicle seat, and an air valve for controlling admission and discharge of air to and from said pneumatic spring, the improvement comprising first and second sensing devices located at spaced positions above and below a predetermined rated central position of said vehicle seat, respectively, and being responsive to vertical

oscillatory movement of said seat, for emitting electrical signals which differ from each other with respect to the direction of vertical movement of said seat as sensed by said sensing devices, a counter means for receiving and summing said electrical signals from said sensing devices, said counter means having a predetermined starting value, a first predetermined limiting value corresponding to a condition wherein the sum of the signals received from said first and second sensing devices is a predetermined amount greater than said starting value and



a second predetermined limiting value corresponding to a condition wherein the sum of the signals received from said first and second sensing devices is a predetermined amount less than said starting value, said counter summing said signals from said sensing devices until one of said limiting values is reached, whereupon the counter means is reset to said starting value and emits an electrical control signal to said air valve, said air valve being responsive to said electrical control signal emitted by said counter means for operating said pneumatic spring to position said seat at the rated central position thereof.

4,638,983

APPARATUS FOR RESILIENTLY MOUNTING A VIBRATING BODY

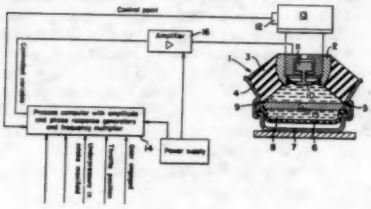
Werner Idigkeit, Weinheim; Klaus Kurr, Weinheim-Hohensachsen, and Gerd-Heinz Ticks, Wald-Michelbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 756,999

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433255

Int. Cl.[4] B60K *5/12;* **F16F** *13/00, 15/04*

U.S. Cl. 267—140.1 **15 Claims**



1. An apparatus for the resilient mounting of a vibrating body, said apparatus comprising a mounting bracket and a pedestal which are interconnected through a resilient element that contains a liquid-filled hollow space, a compensating baffle associated with a positioning element being provided whose adjustment permits compensation of the pressure variations in the liquid caused by disturbing vibrations, characterized in that the compensating baffle (10) bounds the working space (9) itself and covers at least 10 percent of the boundary surface of the working space; that the positioning element (11) is adapted to be actuated by a primary element (12) which detects disturbing vibrations of said body; and that the primary element and the positioning element are interconnected through a freely programmable control unit (14).

4,638,984

EXTERNAL APPARATUS FOR BUTT WELDING TWO PIPES

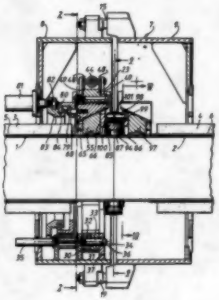
Xavier F. Puisais, Perret; Jean-Pierre Hamon, Cergy; Michel J. Jegousse, Saint-Herblain, and Michel Kaluszynski, Vitry-su-Seine, all of France, assignors to Total Compagnie Francaise des Petroles, Paris, France

Filed Oct. 9, 1985, Ser. No. 785,648

Claims priority, application France, Oct. 22, 1984, 84 16111

Int. Cl.[4] B23K *37/04*

U.S. Cl. 269—43 **6 Claims**



1. An externally applied apparatus for butting two tubular elements (1, 2) to be joined by welding, comprising: two frames (8, 9), each of which is provided with gripping means comprising a plurality of radially oriented jaws (55–64) for the external gripping of a respective one of the tubular elements and which are connected to one another by articulated jacks (10, 11) for bringing the elements together, wherein said two frames are also connected to one another by a plurality of circumferentially spaced pairs of alignment members (14–19), one member of each pair being carried by one frame, the other member of each pair being carried by the other frame, and the members (20, 21) of each pair being engageable one in the other with the interposition of an elastic means (22).

4,638,985

SHEET HOLDING APPARATUS

Yoshinobu Maeda, Katano; Kohji Fujiwara, Yamatokouriyama, and Takao Naito, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 23, 1985, Ser. No. 790,454

Int. Cl.[4] B25B *1/10, 5/10*

U.S. Cl. 269—244 **6 Claims**

1. A sheet holding apparatus comprising:

a pair of interconnected rails supported on a base for slidably holding edge parts of a sheet, disposed parallel to each other in a direction of transfer of said sheet, at least one of said rails being movable in a direction lateral thereto, to adjust distance between said pair of rails,

plural guide holders, at least one thereof being movable in a direction along said rails, to adjust distance therebetween to correspond to holes of said sheet,

plural positioning guide pins fixed on said guide holders, and being adapted to be inserted into holes of said sheet to hold said sheet at a predetermined position,

driving means for driving at least one rail and one guide holder.

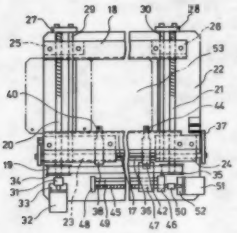
4. A sheet holding apparatus comprising:

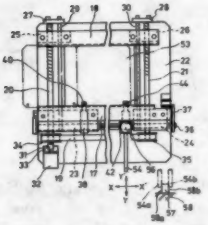
a pair of interconnected rails for holding edge parts of a sheet, disposed parallel to each other in a direction of

transfer of said sheet, at least one rail being adjustably movable in a direction lateral thereto,

plural guide holders, at least one guide holder being adjustably movable in a direction along said rails to correspond to holes of said sheet.

plural positioning guide pins being fixed on said guide holders, being adapted to be inserted into holes of said sheet to hold said sheet at a predetermined position,





a driving rod which is projecting from said at least one of said guide holders,

a base for holding said rails and plural guide holders, and being movable in Cartesian coodinates,

a fixed pin to be contacted with said driving rod, and being free from said base.

4,638,986

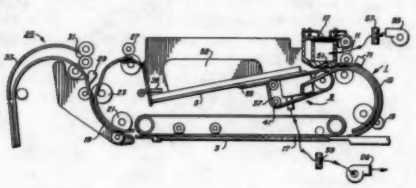
FEEDABILITY SENSOR FOR A VACUUM CORRUGATED FEEDER

Raymond W. Huggins, Pittsford, and Ralph A. Shoemaker, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1984, Ser. No. 667,693

Int. Cl.[4] B65H *3/12*

U.S. Cl. 271—98 **18 Claims**



1. In a vacuum corrugation sheet feeder system having an air knife to provide air pressure to separate a bottom sheet from the remainder of the sheets in the stack in a sheet feeder tray, the method of controlling the air pressure comprising the steps of:

driving the sheet feeder tray at resonant frequency,

increasing the air knife pressue from a point where the sheet stack moves with the tray to the point where the sheet stack remains stationary,

estimating the weight of the stack,

estimating the frictional force to maintain a given vibrational amplitude,

determining the coefficient of friction between the bottom two sheets of the stack, and

controlling the amount of air pressure from the air knife until a predetermined coefficient of friction is achieved.

4,638,987

AUTOMATIC DOCUMENT FEEDER

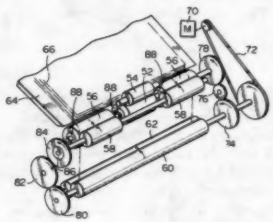
Yasuo Sakurai, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 16, 1985, Ser. No. 809,192

Claims priority, application Japan, Dec. 20, 1984, 59-267378

Int. Cl.[4] B65H *7/02*

U.S. Cl. 271—111 **8 Claims**



1. An automatic document feeder, comprising:

a separator roller and first feed rollers which are mounted coaxially with said separator roller;

a friction roller driven by said separator roller when the separator roller is rotated for separating documents stacked on a tray one at a time;

second feed rollers mounted coaxially with each other and held in contact one with each of the first feed rollers for feeding a document which has been separated by the separator roller;

reversible drive means drivably connected to the coaxial separator roller and first feed rollers and to said coaxial second feed rollers by a gearing; and

means responsive to a motion of the reversible drive means in one direction for rotating the separator roller and the first feed rollers in said one direction such that the separator roller drives the friction roller to separate a document and the first feed rollers drive the second feed rollers associated therewith to feed the separated document, and responsive to a motion of the drive means in the other direction for rotating the second feed rollers in said other direction such that the second feed rollers drive the first feed rollers associated therewith to further feed the document with the separator roller driven by the document which is fed by the first and second feed rollers.

4,638,988

SHEET STACK SUPPORT TRAYS

Ian G. Kershaw, Old Stevenage, United Kingdom, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 7, 1985, Ser. No. 742,497

Claims priority, application United Kingdom, Jun. 22, 1984, 8416015

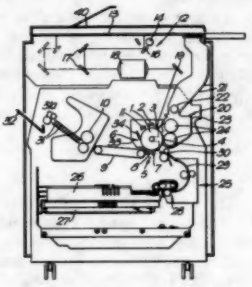
Int. Cl.[4] B65H *1/00*

U.S. Cl. 271—171 **2 Claims**

1. In a document sheet feeder for a copier with a document stacking tray with variabley spaced-apart edge guides, in which flimsy document sheets of various dimensions must be stacked in said tray and fed out from said tray between said

edge guides without mis-stacking or binding between said edge guides, yet in which said edge guides must maintain substantial alignment of said documents by maintaining said edge guides spaced apart by a distance only slightly greater than the dimensions of the documents being so stacked and fed, wherein one of said edge guides is fixed and the other is resettable to variable spacings relative thereto to accommodate different document sheet dimensions, and wherein said resettable side guide is resettable by a slideable movement of said side guide and an integral slide mounting therefor which is integral with said tray, the improvement wherein:

said resettable edge guide is slideably mounted to said slide mounting therefor with a preset limited degree fo allowable independent slideable movement between said resettable edge guide and said slide mounting,



and wherein preset spring force spring means are mounted to interconnect between said resettable edge guide and said slide mounting thereof,

said spring means being adapted to be compressed upon said resetting of said edge guide,

and said spring means being adapted to expand after said resettable edge guide has been reset to automatically slideably move said resettable edge guide away from said fixed edge guide by a small preset limited distance by said slideable movement between said resettable edge guide and its said slide mounting.

whereby said resettable edge guide retracts by said limited distance away from the documents when it is released after being pushed against a stack of documents in said tray.

4,638,989

DEVICE TO PREVENT TRANSPORT OF POORLY ALIGNED COPY PAPER

Yoji Senoo, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1985, Ser. No. 771,012

Claims priority, application Japan, Sep. 3, 1984, 59-134088[U]

Int. Cl.[4] B65H *7/08*

U.S. Cl. 271—227 **4 Claims**

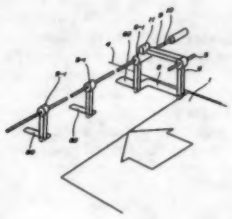
1. A device for ensuring correct transport of sheet material along a sheet material path comprising:

guide plate means, provided adjacent said sheet material transport path, for supporting said sheet material during transport, said guide plate means having an elongated reference edge parallel to said transport path and along one edge thereof, said elongated reference edge guiding an edge of said sheet material therealong during correct transport;

inlet feed means for feeding said sheet material to said transport path adjacent said guide plate means;

a plurality of actuator arms positioned transverse to said transport path, said actuator arms, when in a material restricting position inhibiting movement of said sheet material along said paper path, said actuator arms being collectively movable from said transport path in response to the pressure of said sheet material contacting at least a majority of said actuator arms and therefore being aligned with respect to said transport path; and

stopper means, positioned along said transport path upstream from said actuator arms and adjacent said elongated reference edge, for determining the presence of said sheet material adjacent said elongated reference edge, said stopper means inhibiting the movement of said actuator arms from said material restricting position until the presence of said sheet material is detected, thereby enabling movement of said actuator arms.



4,638,990

ROLL FEED APPARATUS WITH ADJUSTABLE NIP

Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

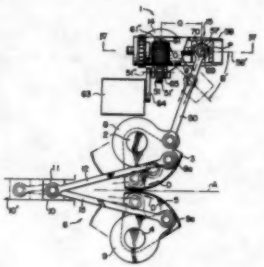
Filed Jul. 23, 1985, Ser. No. 757,980

Claims priority, application Japan, Jul. 27, 1984, 59-114306[U]

The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.

Int. Cl.[4] B65H *17/36*

U.S. Cl. 271—272 **1 Claim**



1. A roll feed apparatus having a first roll integrally carried by a first roll shaft for oscillatory rotation therewith, a second roll integrally carried by a second roll shaft for oscillatory rotation therewith in the direction counter to that of rotation of said first rcll, said second roll being adapted for cooperation with said first roll in clamping therebetween a sheet and feeding said sheet, and a roll release means for moving, when said rolls are rotated in the directions counter to the feeding directions, said rolls relatively away from each other such as to release the clamping force which has been exerted by said rolls on said sheet, said roll feed apparatus comprising: a pivot member having a first end affixed to a pivot shaft extending from the housing of the apparatus substantially in parallel with the first roll shaft and a second free end, said pivoting member being mounted at a portion which is intermediate between said first and said second ends on a first roll shaft, said pivot member being adapted to cause, when it pivots, said first roll shaft and said first roll to move towards or away from said second

roll; a first adjusting device including a first casing fixed to said pivot member at a position between the second end of said pivot member and said first roll shaft, a first worm gear and a first wheel driven by said first worm gear, said first worm gear and said wheel being housed by said first casing, and a first screw rod held in screwing engagement with said wheel and having one end contacting said pivot member through a spring, such as to permit, when moved in one or the other direction by the rotation of said first wheel, an adjustment of a pressing force by which said pivot member is pressed such as to urge said first roll towards said second roll; and a second adjusting device including a second casing fixed to said housing, a second worm gear and a second wheel driven by said second worm gear, said second worm gear and said second wheel being housed by said second casing, and a second screw rod held in screwing engagement with said second wheel and having one end connected to said first casing, said second screw rod being adapted to cause, when moved in one or the other direction by the rotation of said second wheel, said pivot member to pivot through said first casing, such as to permit an adjustment of the size of the gap between said rolls.

4,638,991

ADJUSTABLE NIP ROLL FEED APPARATUS WITH BRAKING/RELEASING DEVICE

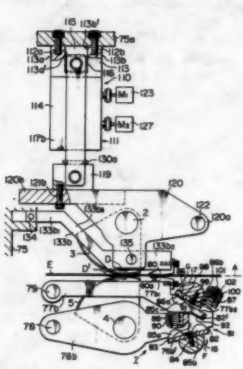
Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 756,630

Claims priority, application Japan, Jul. 26, 1984, 59-112561[U]; Jul. 26, 1984, 59-112562[U]

Int. Cl.[4] B65H *17/36*

U.S. Cl. 271—272 **2 Claims**



1. A roll feed apparatus having a first roll integrally carried by a first roll shaft for oscillatory rotation therewith, a second roll integrally carried by a second roll shaft for oscillatory rotation in the direction counter to that of rotation of said first roll, said second roll being adapted for cooperation with said first roll in clamping therebetween a sheet and feeding said sheet, a releasing/braking means for moving, when said rolls are rotated in the directions counter to the feeding directions, said second roll away from said first roll such as to release the clamping force which has been exerted by said rolls on said sheet, said releasing/braking means having first and second braking members, the first braking member being adapted to be moved towards said second braking member such as to temporarily fix said sheet when said sheet is unclamped from said rolls, and an adjusting device for adjusting the gap between said first and second rolls, wherein said adjusting device includes a pivot member having one end fitted on a first pivot shaft extending from the housing of the apparatus substantially in parallel with said first roll shaft and another end which is free, said pivot member being mounted at a portion between said fitted end and said free end on said first roll shaft, said pivot member being adapted to cause, when it pivots, said first roll shaft and said first roll to move towards and away from said second roll, and wherein said releasing/braking means includes a braking position adjusting arm disposed between said pivot member and the path of feed of the sheet and pivotally carried by said pivot member for pivotal movement about a second pivot shaft parallel to said first roll shaft, said braking position adjusting arm having one end pivotable on a third pivot shaft disposed adjacent said free end of said pivot member, said one end of said braking position adjusting arm being mounted on said housing for a slight sliding motion together with said third pivot shaft in the direction of feed of said sheet and in the direction counter to the feeding direction, another end of said braking position adjusting arm carrying said second braking member, and the positions of said first, second and third pivot shafts, the position of said first roll shaft, the position of said second braking member and the radius of said first roll being determined in relation to one another such that an imaginary plane connecting the portions of said first roll and said second braking member closest to the path of feed of said sheet is moved, when said pivot member pivots over a predetermined angle, substantially in parallel with the path of feed of said sheet.

4,638,992

SORTING APPARATUS

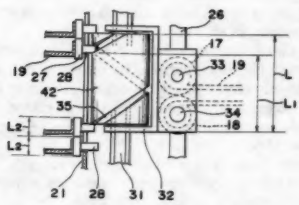
Akiyoshi Johdai; Hirokazu Yamada; Yoshikazu Ikenoue, and Takuma Ishikawa, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1985, Ser. No. 792,733

Claims priority, application Japan, Nov. 7, 1984, 59-235606

Int. Cl.[4] B65H *39/11*

U.S. Cl. 271—293 **9 Claims**



1. A sorting apparatus for sorting or collating copy paper sheets from a copying machine comprising:

a frame adapted to attach to a copying machine;

a plurality of bins supported on said frame for movement in a vertical direction, an adjacent pair of said bins being separated by a first predetermined distance in a non-expanded condition when copy paper sheets are not fed therebetween and being separated by a second predetermined distance in an expanded condition when copy paper sheets are fed therebetween, said second predetermined distance being greater than said first predetermined distance, each of said bins having a pair of pin members extending therefrom;

a pair of vertical shafts rotatably mounted on said frame;

a pair of cylindrical cams, each of which is mounted on a respective one of said vertical shafts, said cams being fixed for rotation with said vertical shafts and said cams being freely slidable in a vertical direction along said vertical shafts, each of said cams having a spiral groove formed on an outer cylindrical surface thereof for engagement with a respective one of said pair of pin members extending from a respective bin, each of said cams having a height in said vertical direction which is equal to at least the sum of said first and second predetermined distances, whereby a pair of adjacent bins are moved to an expanded condition

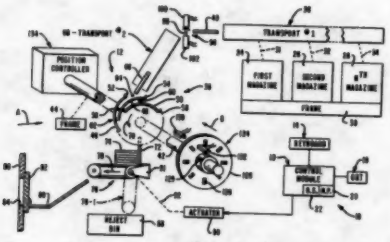
without vertical movement of bins located above or below the bins being moved to an expanded condition.

4,638,993

POSITION CONTROL FOR A STACKER WHEEL

Robert H. Granzow, Miamisburg, and Desh B. Gupta, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 29, 1981, Ser. No. 278,273
Int. Cl.[4] B65H *29/20*
U.S. Cl. 271—315 8 Claims



1. In a media dispensing apparatus, the combination comprising:

a stacker wheel rotatably mounted in said apparatus;

said stacker wheel having compartments located around the periphery thereof with each said compartment having spaced ends providing an entrance area to the associated one of said compartments;

means for transporting media in spaced relationship along a path leading to a loading area with regard to said stacker wheel;

means for detecting the presence of a leading edge of one of said media in said path at a predetermined point from said loading area and also for generating a first signal in response thereto;

means for determining the rotational position of each said compartment of said stacker wheel with regard to said loading area to produce a second signal indicative of said position; and

means for rotating said stacker wheel and also for varying the velocity, when necessary, of said stacker wheel in response to said first and second signals so as to enable the leading edge of one of said media to be moved into a said compartment by said transporting means without contacting the associated said ends;

said means for rotating said stacker wheel and also for varying said velocity, hereinafter referred to as position controller, will vary said velocity, when necessary, in only a first direction; and

said stacker wheel having a shaft to rotate it and said position controller comprising:

a motor;

a resilient coupling means being operatively coupled between said motor and said shaft; and

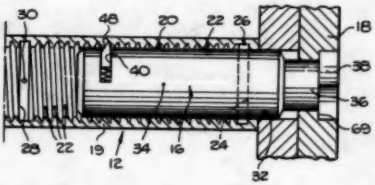
a means for decelerating said shaft being operatively coupled to said shaft whereby as said motor rotates said shaft and stacker wheel via said resilient coupling means, said decelerating means will reduce said velocity of said shaft and stacker wheel in response to said first and second signals.

4,638,994

QUICK-BOLT LOCKING SYSTEM

Brian J. Gogarty, 5348 N. Magnolia, Chicago, Ill. 60640

Filed Jul. 30, 1984, Ser. No. 636,121
Int. Cl.[4] A63B *11/00*
U.S. Cl. 272—122 10 Claims



1. An adjustable dumbbell, comprising,

a tubular main bar,

a plurality of weights having central holes therein,

an inner bar at each end of the main bar extending into the main bar, and having its outer end projecting outwardly beyond the main bar,

the holes in the weights being sufficiently large to pass over the outer end of the inner bar, and the longitudinally inner weight at each end bearing against the end of the main bar, and

a locking collar at each end, having a central hole capable of passing over the end of the inner bar, the inner bar and the locking collar being capable of being interlocking for preventing the locking collar from being removed over the inner bar, and

the inner bar and main bar having interlocking elements enabling interlocking the inner bar and main bar in response to pushing the inner bar axially inwardly, to a locking position locking the weights against the end of the main bar, and being capable of being threaded outwardly to release the weights.

8. Mounting means for mounting a member forming a central hole to a support, comprising,

a support having a front face against which the member engages, and a recess opening through that front face, the member being positionable against said front face with the hole in register with the recess, and

locking means including a continuous and rigid main bar and an inner bar, the inner bar including a shank insertable into the recess and having a polygonal head on its outer surface, the polygonal head being dimensioned for passing through the hole in the member, and the main bar having a central hole sized to receive said polygonal head therethrough, and the marginal edge of the hole defining an outwardly facing socket capable of receiving said polygonal head in wrench-like position and whereby to the main bar to function as a wrench for turning the inner bar, and the inner bar and the surface of the recess having interlocking elements capable, in response to manipulation of the main bar, of releasably locking the member to the support,

one of the members having a continuous thread made up of buttress teeth having inclined surfaces facing axially outwardly and radially straight surfaces facing axially inwardly, and

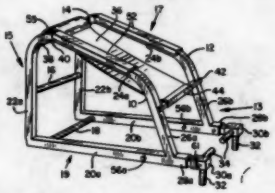
the inner bar having a insert tooth, yieldable radially, capable of snapping past the teeth in response to sliding the inner bar axially inwardly, but necessitating rotationally threading the inner bar to withdraw it axially outwardly.

4,638,995

EXERCISE CHAIR

Jerry L. Wilson, 485 NW. 170th Dr., Beaverton, Oreg. 97005

Filed Jan. 25, 1985, Ser. No. 694,950
Int. Cl.[4] A63B 23/02
U.S. Cl. 272—144 13 Claims



1. An exercise chair, comprising:

(a) a pair of frame means, disposed substantially parallel and spaced apart from one another, for supporting the chair on an underlying surface;

(b) connecting means disposed between said pair of frame means for rigidly attaching said frame means to one another;

(c) seat means for supporting a person seated on said exercise chair;

(d) anchor means for removably attaching said seat means to said frame means so as to be positioned therebetween;

(e) a pair of elongate shaft means for supporting a person performing physical exercises while said seat means is removed and a portion of said person's body resides between said frame means in the position of said seat means when attached, each of said shaft means being attached at one end thereof to one of said frame means and being unattached at the other end thereof; and

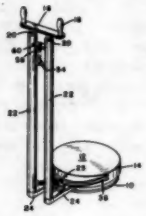
(f) attachment means movably connecting said elongate shaft means to said frame means for orienting said elongate shaft means in a first position where they are directed towards one another and a second position where they are not directed towards one another.

4,638,996

EXERCISE APPARATUS

Luther G. Simjian, Fort Lauderdale, Fla., assignor to Command Automation, Inc., Fort Lauderdale, Fla.

Filed Aug. 20, 1985, Ser. No. 767,524
Int. Cl.[4] A63B 23/02
U.S. Cl. 272—146 24 Claims



1. An exercise apparatus comprising:

a stationary support;

a turntable platform mounted upon said support for oscillating rotating motion about a centrally disposed axis of said platform and adapted to support a person in standing position;

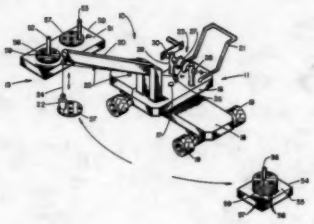
at least one substantially vertically disposed post mounted forward of the perimeter of said platform and supported for reciprocating substantially vertical, linear motion, and drive means coupled between said platform and said post for causing, responsive to oscillating rotating motion of said platform, said post to be driven in reciprocating vertical motion.

4,638,997

COMBINATION TOY AND GAME

Gary E. Clark, Sikeston, Mo., assignor to G. W. Gilmore, Sikeston and R. G. Heywood, St. Louis, both of, Mo., part interest to each

Continuation-in-part of Ser. No. 596,040, Apr. 2, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 782,937
Int. Cl.[4] A63F 9/00
U.S. Cl. 273—1 GD 13 Claims



9. A combination toy and game apparatus for two players, comprising two sets of distinguishable, magnetic metal scoring pieces and each set thereof comprising a multiplicity of relatively flat and stackable discrete members having scoring indicia thereon, first and second spaced stations for holding said two sets of discrete scoring pieces, said first station being a starting station and including a pair of separate and spaced apart vertical pegs, each of which holds all of the scoring pieces in one of said sets in a vertically stacked starting condition, said second station being a scoring station and including at least one vertical peg adapted to receive all of the scoring pieces of at least one of said sets in a stacked condition thereon, all of said discrete scoring pieces in both sets having a central opening for the stacking of said scoring pieces on said vertical pegs, and magnetic toy means for individually transferring said discrete scoring pieces sequentially from said spaced pegs of said starting station to said second station, said magnetic toy means comprising crane means having a boom member adapted to be moved in a prescribed lateral horizontal arc between said starting and scoring stations, and magnet means adapted for selective vertical movement relative to said boom member and the vertical pegs of said starting and scoring stations whereby said scoring pieces are individually engagable by said magnet means and movable thereby in said vertical and horizontal paths of transfer from said starting station to said scoring station.

4,638,998

SINGLES STICK FOR NET HEIGHT ADJUSTMENT

John L. Shannon, Jr., 13297 Cardinal Creek Dr., Eden Prairie, Minn. 55344

Filed Apr. 19, 1985, Ser. No. 725,359
Int. Cl.[4] A63B 71/02
U.S. Cl. 273—29 BB 14 Claims

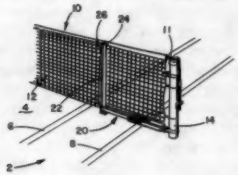
1. An attachment for a post which supports one end of an athletic net, which comprises:

(a) an elongated stick member having a height which is sufficiently long so that the stick member is capable of being wedged between a top edge of the net and the ground to raise the top edge of the net from its otherwise undisturbed orientation;

(b) means for releasably storing the stick member on the post so that the stick member is convenient for use,

(c) means for extensibly connecting the stick member to the post so that the stick member may be pulled toward or away from the post after release therefrom; and

(d) means responsive to movement of the stick member away from the post for limiting the extension of the connecting means to a predetermined distance in an operative position thereof which is selected in conjunction with the height of the stick member to raise the height of the net a precise amount at a particular point along its span, whereby the net may be accurately adjusted without having to manually measure the location of the stick member relative to the post.

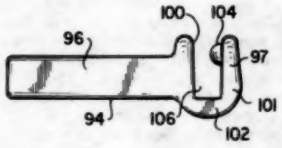


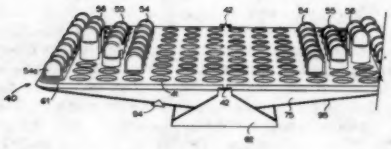
4,638,999

CLIPS FOR BALANCING TILTABLE BOARD GAME

Tadeusz W. Keska, Warwick, R.I., assignor to Jack B. Slimp, Jr., Manassas, Va.

Filed Feb. 15, 1984, Ser. No. 580,267
Int. Cl.⁴ A63F *3/02, 9/00*
U.S. Cl. 273—258 **20 Claims**





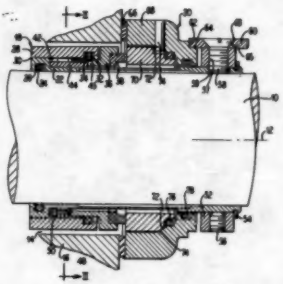
20. In a game which includes a game board which tilts about projections extending from the board, means to adjust the balance of the board relative to said projections which comprises a pair of depending vertically disposed edges on the board extending generally horizontally and normally relative to said projections, said edges having a bead along their lower aspects, and means to adjust the balance of the board comprising U-shaped resilient clip means which is resiliently received by and bears on one of said edges above said bead and is slidable along said edge above said bead, said edges being generally lower than said projections and being inclined relative to the surface of the game board by not more than about 5°.

4,639,000

AUTOMATIC ALIGNING CARTRIDGE MOUNT SEAL

Dale J. Warner, 3916 Belmoor Dr., Palm Harbor, Fla. 33563

Filed Apr. 10, 1986, Ser. No. 850,107
Int. Cl.⁴ F16J *15/34*
U.S. Cl. 277—41 **13 Claims**



1. A cartridge mount seal for mounting on and sealing a rotatable shaft which extends through an opening in a machine wall, comprising:

a rotary seal unit including sleeve means for extending through the opening in the machine wall and for sealingly receiving the shaft therethrough, a seal ring, a seal ring adapter mounting said seal ring, drive means coupling said seal ring adapter to said sleeve means, and bias means urging said seal ring adapter and seal ring towards the opening in the machine wall;

a stationary unit for sealed attachment to the machine wall and including a cup-shaped stationary member sealingly mounted on said sleeve means, a chamber in said stationary member including an inner surface of changing diameter, a floating seal member in said chamber and about said sleeve means, said floating seal member sealingly engaging said seal ring and sealed to said cup-shaped stationary member, and anti-rotation means coupling said stationary and floating members, said floating seal member including an arcuate surface for engaging said inner surface in a line contact for automatic alignment of said floating seal member parallel to said seal ring and perpendicular to the axis of rotation of the shaft; and

means for securing said sleeve means to the shaft for rotation therewith.

4,639,001

SELF-CENTERING CHUCK WITH ADJUSTABLE AND REPLACEABLE JAWS

Giuseppe Berardo, Turin, Italy, assignor to Mario Pinto S.p.A., Turin, Italy

Filed Oct. 12, 1984, Ser. No. 660,181
Claims priority, application Italy, Oct. 13, 1983, 68056 A/83
Int. Cl.⁴ B23B *31/16*
U.S. Cl. 279—121 **8 Claims**

1. A self-centering chuck of the type comprising:

an annular body having a frontal face and defining radial recesses;

respective false jaws slidable radially in said recesses and each defining a respective cavity parallel to the axis of the chuck;

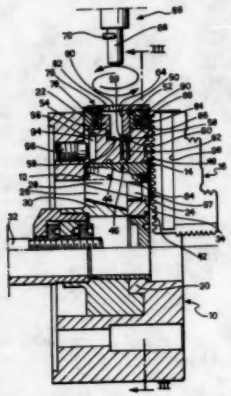
a rod coaxial with the chuck and operable to effect sliding of the false jaws;

respective jaws also slidable in said recesses and radially removable therefrom each jaw projecting from the frontal face of the chuck body and having tangential teeth facing the respective false jaw;

respective pegs slidable parallel to the axis of the chuck in the cavities of the false jaws irrespective of the radial

position of said false jaws and each having teeth engageable with the teeth of a respective jaw, and

key operated means, operable from outside the chuck body, for moving the pegs selectively to disengage and reengage the pegs in relation to the respective jaws,



wherein the improvement consists in each peg having a transverse groove facing radially outwardly of the chuck, and the moving means comprising, for each peg, a respective eccentric rotatable within the respective false jaw about a radial axis parallel to the direction of sliding of the false jaw and engaged in the groove, said eccentric having a formation engageable positively by the key to rotate it.

4,639,002

WHEELED TROLLEY FRAME

Ladislav S. Karpisek, 86 Woodfield Blvde., Caringbah/Sydney, Australia (2229)

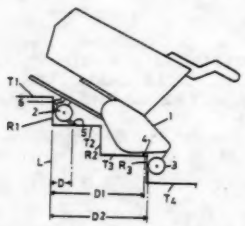
PCT No. PCT/AU84/00181, § 371 Date May 13, 1985, § 102(e) Date May 13, 1985, PCT Pub. No. WO85/01259, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 14, 1984, Ser. No. 751,742

Claims priority, application Australia, Sep. 14, 1983, PG1400

Int. Cl.[4] B62B *5/02*

U.S. Cl. 280—5.2 **4 Claims**



1. A wheeled trolley frame for use on an escalator, four ground engaging wheels comprising a pair of wheels adjacent each of two ends of the frame, said wheel pairs being spaced to thereby prevent the wheel pairs from not only sitting upon a single tread of a step of an escalator but also on the treads of two consecutive steps of an escalator, positioning means on the frame adjacent the first pair of wheels, an abutment face on said positioning means extending beyond the first pair of wheels adapted to engage the riser of a formed escalator step preceding the escalator step over which the first pair of wheels is positioned, a first escalator tread enagaging member on the frame located between the pairs of wheels and between the wheels of the first pair of wheels and vertically spaced above a ground plane on which all of the wheels would normally rest, a pair of second escalator tread engaging means mounted on the frame between the pairs of wheels and respectively adjacent the wheels of the second pair of wheels and vertically spaced above the ground plane, the first and second escalator tread engaging members providing a three point support for the frame when mounted on a formed escalator, said first and second escalator tread engaging members being respectively spaced from the abutment face of the positioning means by predetermined distances, whereby when the frame is on a formed escalator with the abutment face engaging a step riser preceding a first escalator tread the first tread engaging member bears on the first escalator tread and the first pair of wheels are positioned above and spaced from the first escalator tread and the second tread engaging members bear on the following second escalator tread and the second pair of wheels overlie the following third escalator tread and spaced therefrom.

4,639,003

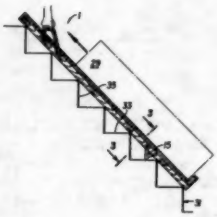
POSITIVE LOCK MECHANISM FOR MOVING BOARD

Roger A. Potter, 6460 Windham Ave., Alexandria, Va. 22310

Filed Feb. 10, 1986, Ser. No. 827,966

Int. Cl.[4] B62B *5/04*

U.S. Cl. 280—5.24 **2 Claims**



1. A piano board for carrying a piano and for use in sliding said piano, either in ascent or descent, over the crests of a flight of stairs with said piano board having a depending spade element to automatically allow said piano board to be rested freestanding, whether in such ascent or descent, at any one or all of the steps of said flight of stairs without the intervention or application of force on the part of any human operator to physically hold said piano board with its piano carried thereon in its rested position on the stairs; said piano board comprising a flat platform, foot, longitudinal runners, cross shaft, depending spade element, torsion spring and lanyard; said piano board being of the sled type and having said flat platform, said flat platform having a lower surface, said flat platform having terminal ends, said foot being upstanding from one of said terminal ends of said flat platform, said longitudinal runners depending from said platform, said runners freely carrying said cross shaft in transverse relationship therewith, said spade element having proximal and distal ends, said cross shaft freely mounting thereon said spade element in pivotal relationship between its said proximal and distal ends with said spade element thereby functioning as a first order lever, said cross shaft freely mounting thereon said torsion spring, said torsion spring having tails at its remote ends, said spring tails being in abutting relationship against and operative engagement with said lower surface of said flat platform and said spade element to constrain said spade element to rotate in one direction, said lower surface of said flat platform functioning as a limit stop to prevent further constrained rotation of said spade element upon said proximal end of said spade element abutting said lower surface of said flat platform, said lanyard being operatively connected to said spade element and, upon said lanyard being pulled sufficiently by a human operator and held as pulled, said spade element being caused to rotate to its retracted position between and within said longitudinal runners; upon ascent of said piano

board over a flight of stairs: said runners sliding upwardly upon and over the crests of said flight of stairs, and the step riser before the next higher crest and said next higher crest, engageable by said spade element, engaging said spade element and causing said spade element to rotate in one direction towards its retracted position, and, upon said spade element passing beyond said next higher crest, the restoring force of said spring causing said spade element to rotate in the direction opposite to its retracted position to its position of automatic engagement and positive lock with said distal end of said spade element engaging the stair tread after said next higher crest and with said proximal end of said spade element abutting said lower surface of said flat platform; and upon descent of said piano board over a flight of stairs: said lanyard being pulled sufficiently by a human operator and being held as pulled to cause said spade element to be rotated to its said retracted position, and said runners sliding downwardly upon and over the crests of said flight of stairs to the next lower step engageable by said spade element, and, upon said lanyard being manually released by the human operator, the restoring force of said spring automatically causing said spade element to rotate to its position of automatic engagement and positive lock with said distal end of said spade element engaging the stair tread of said next lower step with said proximal end of said spade element abutting said lower surface of said flat platform.

4,639,004

HAND CART WITH FULCRUM LEVER AND VERTICALLY ADJUSTABLE AUXILIARY WHEELS

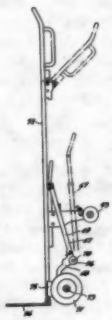
Kazuya Maeda, Osaka, and Yasusuke Ishihara, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Sano Sharyo Seisakusho Co., Ltd., both of, Japan

Filed Nov. 29, 1984, Ser. No. 676,381

Claims priority, application Japan, Nov. 29, 1983, 58-184764[U]; Nov. 29, 1983, 58-184765[U]; Jan. 13, 1984, 59-5095

Int. Cl.[4] B62R *5/02*

U.S. Cl. 280—5.32 **4 Claims**



1. A hand-propelled cart comprising:

(a) a body having a pair of laterally spaced side frames each provided with an inner surface;

(b) a vertically movable mechanism movable along said body, said vertically movable mechanism comprising an upper support pipe having ends positioned respectively in said side frames, a lower support pipe having ends positioned respectively in said side frames, rollers rotatably mounted respectively on said ends of said upper and lower support pipes for rolling engagement with said inner surfaces of said side frames, and a pair of brackets fixed to said upper and lower support pipes;

(c) a pair of main wheels rotatably mounted on said vertically movable mechanism at a lower end portion of said body;

(d) a pair of auxiliary wheels rotatably mounted on said body above said main wheels; and

(e) a control lever pivotably mounted on said vertically movable mechanism and having contact means disposed radially outwardly of said main wheels for contacting a floor to function as a fulcrum when said control lever is turned downwardly, for lifting said body and said main wheels off the floor through the leverage of said control lever.

4. A hand-propelled cart comprising:

(a) a body having a substantially L-shaped side elevational configuration and including a handle and a cargo rest;

(b) a pair of main wheels rotatably mounted on a lower end portion of said body;

(c) a pair of auxiliary wheels rotatably mounted on said body above said main wheels;

(d) a foldable control lever pivotably mounted on said body adjacent to said main wheels and composed of lower and upper levers pivotably interconnected by pivots disposed radially outwardly of said main wheels for contracting a floor to function as a fulcrum when said control lever is turned downwardly, for lifting said body and said main wheels off the floor through the leverage of said control lever;

(e) a first lock mechanism disposed between each of said lower levers and said body for locking each said lower lever against downward angular movement; and

(f) a second lock mechanism disposed between said lower and upper levers in each pair for locking said upper levers against downward angular movement.

4,639,005

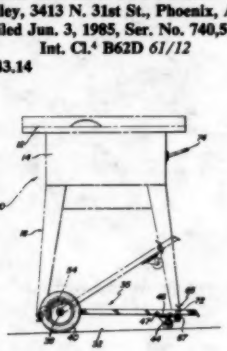
CARRIAGE APPARATUS FOR SAW TABLES

Adrian N. Birkley, 3413 N. 31st St., Phoenix, Ariz. 85016

Filed Jun. 3, 1985, Ser. No. 740,562

Int. Cl.[4] B62D *61/12*

U.S. Cl. 280—43.14 **4 Claims**



1. A dolly for transporting a support table for a table saw, said table having four legs to which said dolly is attached, said dolly comprising:

a low-lying, flat, wheeled, frame structure having a front crossbar and a rearwardly extending, central, truss beam;

wheels mounted on the opposite ends of said front crossbar;

stearing means mounted rearwardly on said truss beam for controlling the directional movement of said dolly;

a front support brace forwardly disposed on and secured to said front crossbar;

wherein said front support brace includes a plurality of spacer struts mounted between said front support brace and said front crossbar, whereby said front support brace is positioned forwardly and below said front crossbar;

a rear support brace adapted to be releasably attached to said truss beam;

said rear support brace including an alignment means mounted thereon, whereby said truss beam engages said alignment means to prevent lateral movement between said truss beam and said rear support brace;

latching means mounted to said truss beam and positioned to releasably attach said rear support brace to said truss beam;

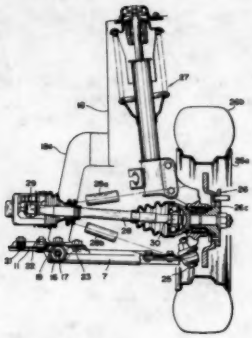
wherein said latching means comprises:
a latch pedal pivotally mounted in said truss beam;
a latch tongue formed on one end of said latch pedal;
a keeper member affixed to said rear support brace, and positioned to be releasably engaged by said latch tongue; and
a spring interposed between said latch pedal and said truss beam to bias said latch tongue in a latched position;
means for attaching said front support brace and said rear support brace to the respective legs of said support table.

4,639,006

SUSPENSION ARM ASSEMBLY FOR SUPPORTING AUTOMOBILE WHEEL

Hiroshi Aikawa, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Japan

Continuation of Ser. No. 331,071, Dec. 16, 1981, abandoned. This application Oct. 22, 1985, Ser. No. 789,929
Claims priority, application Japan, Jan. 19, 1981, 56-5519[U]
Int. Cl.⁴ B60G 7/00
U.S. Cl. 280—96.1 **12 Claims**



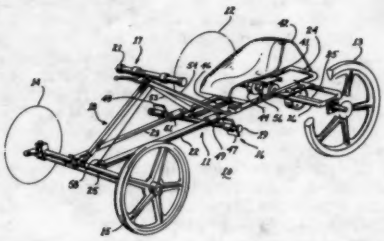
1. A front engine front wheel drive motor vehicle comprising:
a vehicle body;
right and left front road wheels; and
right and left suspension arm assemblies each of which includes a suspension arm supporting one of said front road wheels;
first and second bushing means placed apart from and coaxially with each other along the longitudinal direction of the vehicle,
a substantially flat and horizontal gusset plate swingably joined with said suspension arm by said first and second bushing means, and fixed substantially horizontally to a downwardly facing surface of said vehicle body by at least three nonpermanent fastening means in such a manner that said gusset plate can be removed from said vehicle body and fixed again, said fastening means being distributed along both the longitudinal direction and the lateral direction of the vehicle on a substantially horizontal planar surface of said gusset plate and at least two of said fastening means being spaced along the longitudinal direction of the vehicle at a distance approximately equal to a space between said first and second bushing means, said first bushing means projecting from said gusset plate towards the front of the vehicle, said second bushing means being located ahead of a rear end of said gusset plate under said gusset plate.

4,639,007

EXERCISE VEHICLE

Donald R. Lawrence, Tempe, Ariz., assignor to Fred W. Wagenhals, Tempe, Ariz.

Filed Sep. 19, 1985, Ser. No. 777,919
Int. Cl.⁴ B62M 1/12
U.S. Cl. 280—234 **8 Claims**



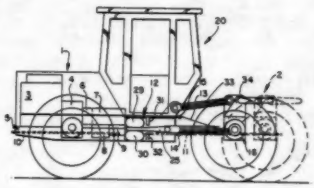
1. An exercise vehicle comprising a framework, a rear axle attached to said framework, a pair of rear wheels operatively attached to the ends of said rear axle, one of said rear wheels being driven by said rear axle, a front axle supported by said framework, a pair of front wheels operatively and steerably mounted on the ends of said front axle, an operator's seat mounted on said framework, an operator's foot actuated member slidably mounted on said framework, a first one-way clutch mounted on said rear axle, a first cable connecting said foot actuating member and said first one-way clutch, whereby moving said foot actuating member moves said vehicle in a forward direction, an extensible steering column pivotally attached at its lower end to said framework adjacent said front axle, a rigid rockable link connecting said extensible steering column at its upper end to said framework rearwardly of said front axle, a hand operated arm attached to the upper end of said steering column, a second one way clutch mounted on said rear axle, and a second cable connecting said rockable link from adjacent said upper end of the steering column to said second one-way clutch whereby moving said hand operated arm moves said vehicle in a forward direction indpendently of said foot actuated member.

4,639,008

SELF-PROPELLING VEHICLE WITH TWO AXLE UNITS CANTILEVERED TOGETHER

Gustav Krettenauer, Gaggenau, and Heinz Kiwitz, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,391
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300335
Int. Cl.⁴ B62D 49/06
U.S. Cl. 280—405 R **22 Claims**



1. A self-propelling commercial vehicle, comprising two units each having and being supported by a single unsprung axle means, one of said units forming a drive unit and including a drive mechanism therefor and a driver place within an area of

the one unit at an end adjacent to the other unit, and means including cantilever means for guiding the other unit, said cantilever means being pivotally connected with the one unit in the vertical direction about a horizontal axis and elastically supported with respect to said one unit, the cantilever means being additionally connected to and pivotal in the vertical direction with respect to a horizontal axis of the axle means of said other unit, and guide means for rectilinear guidance of said other unit, said guide means being connected to both units and disposed offset in the vertical direction to the cantilever means, being detachable to and vertically pivotal about horizontal axes with respect to both the axle means of the other unit and to the drive unit, wherein the connection between the drive and other unit by the cantilever and guide means does not permit unloading of the axle means of the one unit by increased changes in loading on the second unit when the guide means is detached.

4,639,009

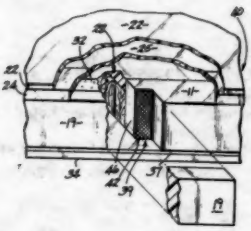
SNOW SKI WITH ELASTOMERIC SIDEWALLS

Franklin D. Meatto, Cromwell, and Edward D. Pilpel, Avon, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Dec. 30, 1985, Ser. No. 814,832

Int. Cl.[4] A63C 5/04

U.S. Cl. 280—602 **13 Claims**



1. An alpine snow ski for skiing across snow covered ground, the ski being of selected length with a contact length intermediate the shovel and the tail and having a binding area beneath where the center of gravity of a skier on the ski is located, comprising in combination:

(a) a bottom running surface;

(b) a pair of bottom edges flexibly mounted to the bottom running surface defining the lateral side limits of the ski along the bottom running surface;

(c) a core positioned above the bottom running surface and intermediate the lateral side limits of the ski;

(d) a plurality of generally horizontally positioned laminate layers below the core and above the bottom running surface and above at least a portion of the core;

(e) a top surface layer extending generally horizontally between the lateral side limits of the ski overlying the core and at least one of the plurality of generally horizontally positioned laminate layers above at least a portion of the core;

(f) a pair of top edges defining the lateral side limits of the top of the ski, the top edges being positioned above the core and beneath the top surface layer; and

(g) a pair of sidewalls extending along the selected length of the ski and between at least a portion of the lateral side limits of the pair of top edges and the bottom edges, the pair of sidewalls being formed at least partially of an elastomeric material and a second sidewall material, the elastomeric material being within the contact length, but extending a distance less than the selected length of the ski and including at least an area generally alongside the binding area where the center of gravity of a skier is located to Permit the bottom edges to flex upwardly to absorb shock as the bottom running surface passes over snow covered ground.

12. In an alpine snow ski having a shovel and a tail, a pair of bottom edges adjacent a bottom running surface and a pair of sidewalls forming a curvature of the sidecut of the ski along the lateral side limits, the ski further being of a selected length with a contact length intermediate the shovel and the tail, the improvement comprising in combination;

(a) the pair of sidewalls being formed at least partially along the contact length of an elastomeric material and a second sidewall material to form a composite sidewall, said second sidewall material and said elastomeric material having at least one stepped portion fitting beneath and interiorly to engage the second sidewall material;

(b) a pair of bottom edges flexibly connected to the bottom running surface, at least the bottom edges on the uphill side flexing upwardly with the elastomeric material in a turn to absorb shock as the bottom running surface passes over snow covered ground to increase the curvature of the sidecut of the ski so that the shovel and the tail dig into the snow permitting a sharper turn with a smaller radius to be effected.

4,639,010

RELEASABLE CROSS-COUNTRY SKI BINDING

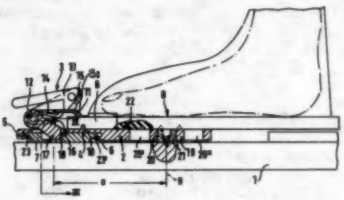
Georg Scheck, Leonberg; Martin Bogner, Ostfildern; Manfred Schmidt, Sindelfingen, and Ulrich Kowatsch, Leonberg, all of Fed. Rep. of Germany, assignors to GEZE GmbH, Leonberg, Fed. Rep. of Germany

Continuation of Ser. No. 557,220, Dec. 2, 1983, abandoned. This application Jan. 29, 1986, Ser. No. 823,962

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3245668

Int. Cl.[4] A63C 9/02, 9/16

U.S. Cl. 280—615 **12 Claims**

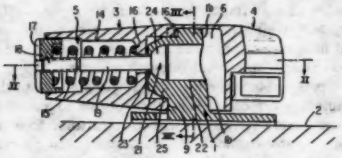


1. A releasable cross-country ski binding for securing to a cross country ski, a shoe having a sole with a toe region, a ball region immediately behind said toe region, and a heel region behind said ball region; said ski binding comprising: means for supporting a toe region of the shoe and a ball region of said shoe, said supporting means comprising a sole plate which includes a forwardly disposed relatively rigid base plate and a rearwardly disposed relatively flexible extension secured to said base plate; means for securing said shoe at said toe region supporting means to an upper surface of a said sole plate while permitting lifting of the heel region of the shoe from the ski during skiing; and means for defining an axis of rotation for the ski shoe relative to the ski, said means for defining said axis of rotation comprising a journal secured to said ski and a corresponding recess arranged in said extension for receiving said journal therein; said axis of rotation extending substantially at right angles to the upper surface of the ski through said ball region supporting means; means for releasing the ski shoe and sole plate from the ski on the occurrence at said toe region of the ski shoe, of lateral forces which correspond to an excessive turning moment about said axis of rotation, including a latch mechanism cooperating with a latch recess, one of said latch mechanism and said latch recess being carried by said sole plate, and the other of said latch mechanism and said latch recess being carried by a latch carrier fixedly mounted on the ski in front of said ball region supporting means.

4,639,011
SAFETY SKI BINDING

Pierre Rullier, Annecy, France, assignor to Salomon S.A., Annecy, France

Filed Feb. 13, 1984, Ser. No. 579,376
Claims priority, application France, Feb. 14, 1983, 83 02309
Int. Cl.[4] A63C 9/085
U.S. Cl. 280—628 57 Claims



1. A safety ski binding adapted to releasably hold one end of a ski boot on a ski, wherein said binding comprises at least two elements comprising:

(a) a jaw comprising a portion adapted to hold one end of said boot and adapted to laterally pivot; and

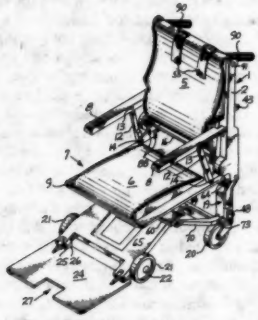
(b) a support, adapted to be fixed to said ski, wherein said support comprises first and second surfaces, wherein said first surface faces said portion of said jaw and said second surface is opposite from said first surface, wherein said support further comprises two downwardly converging lines of support on said second surface, wherein said jaw is adapted to laterally pivot around either one of said two lines of support, wherein each of said lines of support comprises one of the members of the following group:

at least one groove and at least one projection, wherein said jaw comprises the other of the members from said group, wherein said at least one groove on one of said elements of said binding engages said at least one projection on the other of said elements of said binding during lateral pivoting of said jaw around said lines of support.

4,639,012
AIRBORNE FOLDING WHEELCHAIR

Tom M. Jensen, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 14, 1986, Ser. No. 851,611
Int. Cl.[4] B62B 7/06
U.S. Cl. 280—642 10 Claims

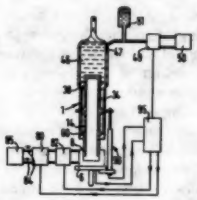


1. A wheelchair assembly, comprising: a back frame having a pair of parallel, vertically elongated side frame members and horizontal frame members secured between said side frame members for forming a rigid back frame structure which is adapted to be secured to a support member; seat pan frame extending horizontally forward from said back frame when in a position for occupancy and being pivotally supported at its aft end to said back frame for upward rotary movement to a vertical storage position; rear support legs formed by a lower section of said back frame, below the pivotal connection of said seat pan frame; front support legs comprising a folding linkage mechanism supportably mounted to the lower section of said back frame independently of said seat pan frame and forwardly extendable therefrom, for forming the front support legs when said linkage mechanism is locked in a forward extended position and being foldable substantially parallel to said back frame while in a retracted position; and wheels mounted to the lower ends of the front and rear support legs for rolling movement of the chair configuration, wherein said wheelchair assembly is usable either as a wheelchair, with said front support legs being forwardly extended, or as a seat with said front support legs in the retracted position and said back frame being secured to the support member.

4,639,013
VEHICLE SUSPENSION ARRANGEMENTS

David A. Williams, Cranfield, and Peter G. Wright, Norwich, both of England, assignors to Group Lotus Car Companies PLC, Norwich, England

Filed Feb. 21, 1985, Ser. No. 704,912
Claims priority, application United Kingdom, Feb. 8, 1985, 8503290
Int. Cl.[4] B60G 17/00
U.S. Cl. 280—707 19 Claims



1. In a vehicle suspension system:

a wheel suspension device, said wheel suspension device comprising a double-acting hydraulic actuator, said hydraulic actuator having a piston movable therein, and gas spring means in parallel with said hydraulic actuator, said gas spring means being controllable to provide a selectively variable offset,

a hydraulic fluid pressure source,

a pressure fluid line communicating said hydraulic actuator with said hydraulic fluid pressure source,

valve means in said pressure fluid line,

sensor means providing an output in response to the sensing thereby at a load change experienced by said suspension device, and

control means responsive to said sensor means output to supply a control signal to said valve means to thereby effect adjustment of said hydraulic actuator before change of said offset of said gas spring means, to accommodate said load change.

4,639,014

VEHICLE SUSPENSION APPARATUS

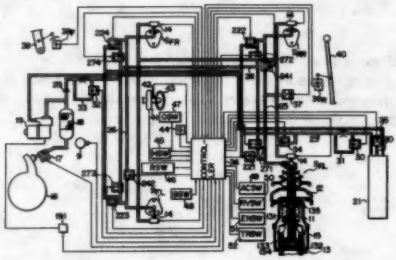
Tadao Tanaka, Okazaki; Sunao Chikamori, Nagoya; Mitsuhiko Harara, Okazaki; Yasutaka Taniguchi; Masanaga Suzumura, both of Nagoya; Minoru Tatemoto, Okazaki; Naotake Kumagai, Aichi; Hiroki Abe, and Shozo Takizawa, both of Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1985, Ser. No. 727,285

Claims priority, application Japan, Apr. 25, 1984, 59-60925[U]; Apr. 8, 1985, 60-51959[U]

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—707 16 Claims



1. A vehicle suspension apparatus comprising:

a vehicle height sensor means for detecting the vehicle height;

timer means coupled to the sensor means for determining a cycle period of vertical vibration of the vehicle height;

switching means coupled to a control means for switching the characteristic of the suspension apparatus to a hard one or a soft one; and

said control means being coupled to said timer means for causing said switching means to hold said suspension apparatus characteristic to said hard one while the cycle period of vertical vibration of the vehicle height is within a predetermined interval of time.

4,639,015

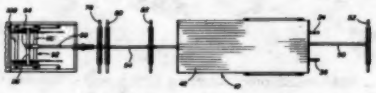
Z-NECK, T-BAR TRAILER

John A. Pitts, 1600 Rosharon Rd., Lot #32, Alvin, Tex. 77511

Filed Aug. 19, 1985, Ser. No. 767,092

Int. Cl.[4] B62D *63/06*

U.S. Cl. 280—789 9 Claims



1. A heavy load handling trailer incorporating a main frame including a main center longitudinal frame member having front and rear ends, towing tongue means carried by the front end of said center frame member and projecting forwardly therefrom, the rear end portion of said center frame member including three central longitudinally spaced and transverse load support members anchored relative thereto and projecting outwardly of opposite sides of said center frame member, a pair of rear opposite side frame members extending between, bridging and anchored relative to corresponding end portion of said transverse members, front-to-rear extending sleeve means anchored relative to said center longitudinal frame member on one side thereof and also anchored to said transverse members, an elongated rear frame extension member adjustably telescoped into said sleeve means and projecting rearwardly of said center frame member and the rear ends of opposite side frame members, a rear transverse load support member carried by the rear end of said frame extension and projecting outwardly from the opposite sides thereto, said trailer frame including tandem axles dependently supported from said central longitudinally spaced transverse load support members, the rear ends of said opposite side members projecting rearwardly of the rear end of said center longitudinal frame member and the opposite ends of said rear transverse load support member including portions overlying and supported from the rear ends of said opposite side frame members when said rear frame extension member is forwardly retracted.

4,639,016

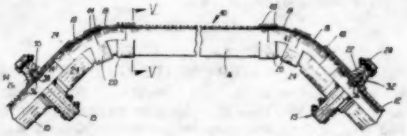
PIPELINE REPAIR KIT

Russell L. Rogers, Munith; Neill D. Perrine, and Richard M. Alexander, both of Jackson, all of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Mar. 12, 1984, Ser. No. 588,354

Int. Cl.[4] F16L *27/00*

U.S. Cl. 285—15 5 Claims



1. A pipeline repair system for interconnecting the spaced and misaligned ends of a ruptured pipeline having a cylindrical exterior surface comprising, in combination, a pair of tubular pipeline fittings each having compression sealing means for producing a sealing connection to the exterior cylindrical surface of a pipeline end and a tubular cylindrical extension for extending beyond the associated pipeline end, a primary rigid linear bridging conduit having cylindrical ends located between said fittings, a pair of angle conduits having cylindrical ends located adjacent each end of said bridging conduit and adjacent a pipeline fitting, each of said angle conduits having an outer cylindrical end and an inner cylindrical end, the axes of said cylindrical ends of an angle conduit intersecting and being angularly offset relative to each other, first rotatable sealing means sealing said inner cylindrical ends of an associated pair of angle conduits in rotatable aligned relationship whereby relative rotation of the associated angle conduits changes the angular relationship of said outer cylindrical ends of the associated angle conduits, second rotatable sealing means defined upon said ends of said bridging conduit rotatably sealing an outer end of each pair of associated angle conduits in communication therewith, and third rotatable sealing means rotatably sealing the other outer end of each pair of associated angle conduits to a pipeline fitting extension in communication therewith to establish sealed communication between the pipeline ends, said sealing means each including annular rotatable locking means interposed between the associated angle conduits, the associated bridging and angle conduits and the associated angle conduits and pipeline fitting extensions permitting relative rotation therebetween and preventing relative axial displacement thereof.

4,639,017

OFFSET NIPPLE

Dennis R. Domas, 7328 N. 22nd St., Phoenix, Ariz. 85020

Filed Dec. 24, 1985, Ser. No. 812,942

Int. Cl.[4] F16L *37/26*

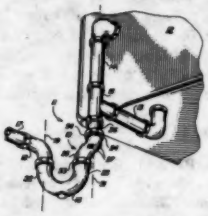
U.S. Cl. 285—38 3 Claims

1. An offset nipple for interconnecting two substantially parallel but nonaligned pipes in waste and vent connections comprising:

a hollow pipe section distorted at each end to form inlet and

outlet ports, said ports being interconnected by an arcuate portion,

said arcuate portion having a roughened surface in the form



of a raised pad on its outer periphery at each of the four quadrants of said arcuate portion for gripping by the installer when using it to interconnect said inlet and outlet ports with nonaligned pipes.

4,639,018

JOINT FOR A WATER-CARRYING PIPE SYSTEM

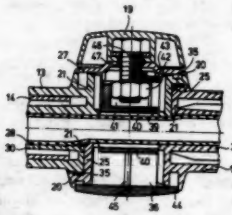
Hans Froelich, Bernstadt; Willi Hepperle, Westerstetten; Johann Katzer, Neu-Ulm, and Christian Stephany, Ulm, all of Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,429

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1984, 3426575

Int. Cl.[4] F16L *27/00*

U.S. Cl. 285—184 **23 Claims**



1. A joint for a liquid-carrying pipe system, in which connected ends of two rigid pipes in each case have a joint shoulder with a disk part provided with a tooth system, arranged in a plane parallel to a longitudinal axis of the pipes and having a bore for receiving a fastening element, the fastening element having a longitudinal axis at right angles to the longitudinal axis of the pipes and, said system having a flexible hose for guiding liquid in the system through the joint, wherein the disk parts are arranged on opposite lateral sides and on either longitudinal side of the joint, the hose being connected in liquid-tight manner to the pipe ends.

4,639,019

LUER CONNECTION

Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 44,943, Jun. 4, 1979, abandoned. This application Jan. 6, 1981, Ser. No. 223,072

Int. Cl.[4] F16L *19/02*

U.S. Cl. 285—332 **20 Claims**

1. A luer connection device which comprises:

a male luer connector comprising a tubular body defining a bore with the front end thereof adapted for insertion into a female luer connector and the rear end thereof adapted for coupling to tubing;

said tubular body having a front portion contiguous with said front end and a main portion that is separated from said front portion by a sleeve-retaining member;

a sleeve having a generally resilient rear portion that is slideable along said main portion and having a front portion that is internally threaded and adapted for receiving an outer flange carried by the female luer connector;

said main portion of said tubular body being tapered outwardly in the forward direction whereby increased compression between the rear portion of the sleeve and said main portion occurs as said sleeve is moved forwardly.

4,639,020

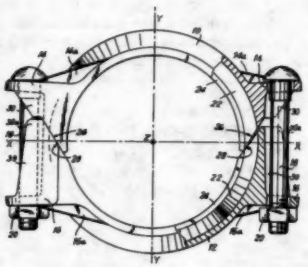
SELF-ADJUSTING PIPE CLAMP AND COUPLING

Robert Rung, Hopatcong, N.J., and Lani G. Ache, Allentown, Pa., assignors to Victaulic Company of America, Easton, Pa.

Division of Ser. No. 512,934, Jul. 12, 1983. This application Jun. 5, 1986, Ser. No. 871,453

Int. Cl.[4] F16L *17/00*

U.S. Cl. 285—367 **5 Claims**



1. A segmented pipe coupling comprised of at least two arcuate coupling segments to be assembled in end-to-end relationship and encircling the juxtaposed ends of pipes to be coupled, the coupling segments having means providing for the reception of a sealing gasket and having radially inward extending engagement means for clamping engagement with the ends of the respective said pipes, further including:

end faces at each end of the respective coupling segments for direct sliding engagement with a juxtaposed end face of an adjacent coupling segment;

said end faces extending perpendicular to the X-Y plane of the coupling, and extending at an oblique angle to the diametral X-Z plane of the coupling; and,

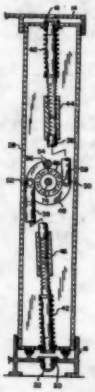
traction means for urging said end faces towards each other to produce sliding of respective juxtaposed pairs of end faces relative to each other, in order to produce a reduction in the internal circumference of the coupling and cause said engagement means to clamp onto the exterior surface of said pipes to immobilize said pipes.

4,639,021

DOOR LOCK

Jimmie L. Hope, 3560 SW. Red Cedar Way, Lake Oswego, Oreg. 97034

Filed Nov. 25, 1985, Ser. No. 801,298
Int. Cl.[4] E05C 5/00
U.S. Cl. 292—7 12 Claims



1. A door lock comprising:
(a) a rotary actuator,
(b) means for mounting the actuator on the door,
(c) a shaft assembly connected for rotary movement to the actuator,
(d) at least one spring-biased bolt rod mounted on the door for reciprocation between door-locking and door-unlocking positions,
(e) a crank connected to the bolt rod and operable to shift the bolt rod to its spring-biased door-locking position,
(f) stop means positioned to stop the movement of the crank in the locking and unlocking positions of the bolt rod,
(g) rotary interengaging means releasably connecting the crank to the shaft assembly,
(h) a latch operable to maintain the spring-biased bolt rod releasably in its door-locking position, and
(i) trip means arranged for disengaging the rotary interengaging means when the bolt rod is in its spring-biased, door-locking position, thereby actuating automatic unlocking of the door.

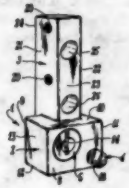
4,639,022

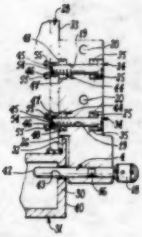
SLIDING WINDOW OR DOOR LOCK

Gerald F. Dunphy, Glen Waverley, and Lance E. Best, Vermont South, both of Australia, assignors to Ogden Industries Pty Ltd, Victoria, Australia

Filed Nov. 30, 1984, Ser. No. 677,608
Claims priority, application Australia, Nov. 30, 1983, PG 2638/83
Int. Cl.[4] E05C 1/04; E05B 65/08
U.S. Cl. 292—150 15 Claims

1. A lock including a body which is adapted to be secured to one of two relatively movable members, said body having a mounting part and an actuator part, a locking bar mounted on said actuator part for relative axial movement between an operative position in which an end portion of said bar projects beyond a back surface of said actuator part for location within a hole provided in the other of said two members and an inoperative position in which said end portion does not so project, locking means carried by said actuator part and being operable to hold said locking bar against movement from the operative to the inoperative position, said mounting part projecting laterally from one side of said actuator part in a direction transverse to the longitudinal axis of said bar, and having four sides which extend in that direction, two of said four sides constituting substantially parallel front and back sides of the mounting part and each of the other two said sides extends between said front and back sides in substantially parallel relationship, said front and back sides being spaced apart in the axial direction of said locking bar, at least one primary fastening bore extending through said front and back sides of the mounting part, and at least one secondary fastening bore extending through said other sides of the mounting part in a direction transverse to the axis of said primary fastening bore and also transverse to said direction of projection of said mounting part, the arrangement being such that said lock can





be secured either to an outwardly facing surface of said one member or to a surface which extends transverse to said outwardly facing surface, and in the former case said mounting part projects outwardly from said outwardly facing surface and is secured thereto by fastening means (for securing said body to said one member can be associated with either said primary or secondary bore whereby said body can be secured to a surface of said one member which is either parallel to or transverse to said locking bar axis) extending through said primary fastening bore, whereas in the latter case said mounting part is located to one side of said outwardly facing surface and is secured to said transverse surface by fastening means extending through said secondary bore.

4,639,023

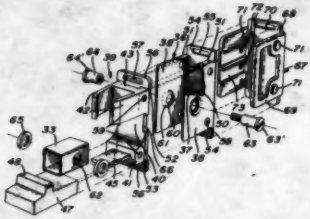
PIVOTABLE LOCKING BAR FOR PATIO DOORS

Richard Boisvert, 7150 MB Jodoin Street, app. 703, Ville d'Anjou, Canada H1J 2J3

Filed May 30, 1985, Ser. No. 739,102
Int. Cl.[4] E05C 17/04
U.S. Cl. 292—262 3 Claims

1. A locking bar assembly for use between a vertical abutment member and a horizontally-slidable member of the type movable along a path between an opened position and a closed position, comprising: a locking bar having inner and outer end portions, a bracket assembly, means for mounting said bracket assembly to one of said members, pivotal means for mounting said locking bar adjacent its inner end portion on said bracket assembly for pivotal movement in a vertical plane about a pivotal axis carried by said bracket assembly between a generally horizontal locking position in which the outer end portion of said locking bar abuts the other of said members, and an upright position in which said locking bar permits opening

movement of said slidable member towards said bracket assembly, at least the inner end portion of said bar having a generally square cross-section and having opposite side faces, a top face and an underface as defined when said locking bar is in locking position, said bracket assembly including a cross-sectionally U-shape metallic casing defining a base plate and side walls, said base plate being elongated and vertically extending when fixed in position by said mounting means, a transverse shaft carried by said side walls and on which said inner end portion of said locking bar is pivotally mounted, spacer means about said transverse shaft to produce a space between each side face of said locking bar and the respective side walls, a stabilizing member made of resilient material and located within the confines of said casing, said stabilizing member including an intermediate plate applied flat against said base plate intermediate said transverse shaft and said base plate, the top face of said



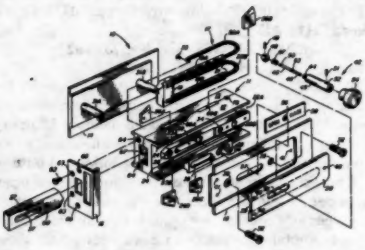
locking bar abutting said intermediate plate in the upright position of said locking bar, a pair of transversely-spaced clasping arms and a bottom tongue integral with and projecting from said intermediate plate between said side walls, said clasping arms extending in said spaces at either side of said locking bar and located above said transverse shaft, said tongue extending below said locking bar, each clasping arm having a terminal inner shoulder, the two shoulders moving away from each other by slidable engagement with the opposite side faces of said locking bar during pivotal movement of the latter between said two positions and overlapping the underface of said locking bar when the latter is in said upright position, and a bumper body, of elastomeric material, fixed to said tongue, extending below said locking bar in either position of the latter, and extending beyond said side walls and from the underface of said locking bar when the latter is in upright position.

4,639,024

SIMULTANEOUSLY OPERATED DEAD BOLT LOCK AND SECURITY CHAIN

Alois Crepinsek, 97 N. Arizona Pl., Chandler, Ariz. 85224

Filed Dec. 5, 1983, Ser. No. 557,907
Int. Cl.⁴ E05C *17/36*
U.S. Cl. 292—264 **14 Claims**



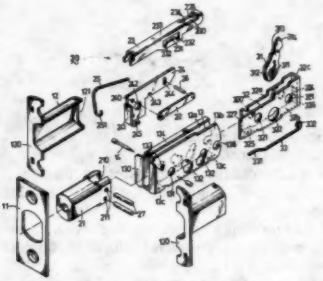
1. A dead bolt lock having an internally housed security chain simultaneously ejected with the dead bolt comprising:
a dead bolt lock having a dead bolt and a self-retracting security chain assembly housed therein, said self-retracting security chain assembly having means for retraction of said self-retracting security chain assembly into said dead bolt lock;
security chain drive linkage means coupled to said security chain assembly for partially ejecting a portion of said security chain assembly from said dead bolt lock; and
externally accessible drive means coupled to said security drive linkage means and to said dead bolt for simultaneously ejecting a portion of said dead bolt and a portion of said security chain assembly from said dead bolt lock.

4,639,025

ADJUSTABLE DEAD BOLT ASSEMBLY

Yaw S. Fann, and Rong-Faa Wu, both of Chia-Yi, Taiwan, assignors to Tong Lung Metal Industry Co., Ltd., Chia-Yi, Taiwan

Filed Mar. 17, 1986, Ser. No. 840,597
Int. Cl.⁴ E05C *1/06*
U.S. Cl. 292—337 **8 Claims**



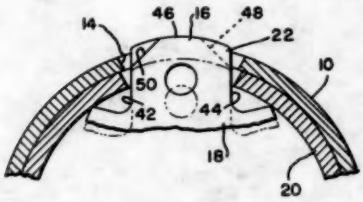
1. A dead bolt assembly for a lock including:
a bolt casing having a front mounting plate at its front side;
a bolt mounted movably in the bolt casing;
an extension housing fixed to the rear end of the bolt casing;
a crank plate mounted in the extension housing to be connected to the lock for transmitting the actuation of the lock to the bolt, the crank plate being turnable about an axis to move the bolt between a locking position and a releasing position; and an improvement which comprises:
an adjustable bolt extension member connected to the rear end of the bolt and housed in the extension housing, the bolt extension member including a fixed member fixed to the bolt and an extensible member pivoted movably to the fixed member and cooperating with the crank plate, one of the fixed member and the extensible member having a longitudinal guide aperture with a front and a rear engaging portion which is turned at an angle relative to the longitudinal aperture, and a pivot pin for pivoting the fixed member and the extensible member through the longitudinal guide aperture, the extensible member being movable between a first portion in which the pivot pin engages in the rear engaging portion and a second position in which the pivot pin engages in the front engaging portion;
means for disengaging the pivot pin from the front engaging portion or the rear engaging portion; and
a crank plate holding means which is disposed in the extension housing and which can be positioned adjustably in the extension housing in a first position and a second position corresponding to the first position and the second position of the extensible member so that the crank plate can always be kept in a cooperative relationship with the extensible member.

4,639,026

DOOR KNOB AND DOOR KNOB CATCH ARRANGEMENT

Jon M. Smallegan, San Mateo, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Oct. 11, 1985, Ser. No. 786,541
Int. Cl.[4] E05B 3/00
U.S. Cl. 292—352 1 Claim



1. An improved door knob and door knob catch arrangement, for door knob-operated, latch mechanisms, including a spindle, a door knob having a cylindrical shank for a latched assembly thereof onto said spindle, and a door knob catch, resiliently projecting form said spindle, and wherein said shank has a relief formed therein for latchingly engaging said catch, the improvement comprising:

first and second ramp means formed on said shank, and on said catch, respectively, for accommodating a forced, slidable engagement of said first ramp means with said second ramp means, (a) to depress said catch, and (b) to allow said shank to slide over such depressed catch, whereby said catch and said relief can effect a mutual, latching engagement therebetween;

said catch having an uppermost projecting surface, relative to said spindle;

said second ramp means comprising a given ramp formed in said surface;

said catch having a pair of parallel faces joined through a pair of lateral edges and said edges join said surface through end corners

said second ramp means further comprising another ramp formed in said surface;

said given ramp comprises a bevel formed of one of said corners, and extending into one of said faces; and

said another ramp comprises a bevel formed of the other of said corners, and extending onto the other of said faces.

4,639,027

THEFT-RESISTANT AUTOMOBILE SIDE COVER

David T. Boyd, 94 Stanford, Irvine, Calif. 92715

Filed Sep. 27, 1985, Ser. No. 781,046
Int. Cl.[4] B60J 11/00
U.S. Cl. 293—128 7 Claims

1. An apparatus primarily for attachment to the exterior side surface of a vehicle for protection of such surface against objects that would otherwise come in contact with the vehicle and damage the surface; the apparatus comprising:

a substantially planar cover of generally flexible material having an interior surface adapted to overlie and remain in substantially contiguous configuration with said vehicle surface; and

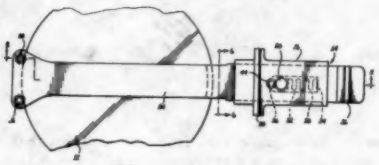
an elongated unitary strap of flexible material attached at its ends to the interior surface of said cover for horizontally encircling a door of said vehicle whereby closure and locking said vehicle door substantially resists unauthorized removal of said cover from said vehicle.

4,639,028

HIGH TEMPERATURE AND ACID RESISTANT WAFER PICK UP DEVICE

Donald M. Olson, Scottsdale, Ariz., assignor to Economic Development Corporation, Phoenix, Ariz.

Filed Nov. 13, 1984, Ser. No. 670,627
Int. Cl.[4] B05G 13/02; B65G 7/12
U.S. Cl. 294—34 18 Claims



1. A device used for picking up wafers, comprising:

a closure channel having an aperture and a first extension protruding upward from the top surface of said closure channel;

a base plate including first groove means for operably engaging one of said wafers;

sliding plate means located between said closure channel and said base plate for operably engaging said one of said wafers, said sliding plate means having an aperture and a second extension protruding upward from the top surface of said sliding plate means, and said sliding plate means slidably engaging said closure channel and said base plate, said sliding plate means having a plurality of grasping extensions located on the top of the end thereof;

spring means located within said aperture of said sliding plate means for returning said sliding plate means to an original position after said sliding plate means has been moved to another position; and

coupling means for releasably coupling said closure channel, said base plate, said sliding plate means and said spring means together, said coupling means having a plurality of holding pins for securely holding said wafers.

4,639,029

TOOL HANDLE

Robert A. Kolonia, R.D. 3, Agnes Rd., Box 318, Milford, N.J. 08848

Filed Aug. 9, 1985, Ser. No. 764,125
Int. Cl.[4] A01B 1/22; B25G 3/34
U.S. Cl. 294—57 36 Claims

1. A hand garden tool handle for a garden tool having a working tool end portion, a socket portion projecting outwardly from the working tool end portion and with a longitudinal central axis, and means for coupling the handle to the working tool end portion, said handle comprising:

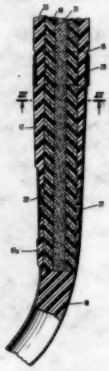
(a) a composite structure including a core member having a molded plastic outer coating over the core member;

(b) the composite structure having a socket end, an intermediate section and a butt end,

(c) the socket end including a substantially circular cross section for insertion into the socket portion with the outer

coating to be disposed between the core member and the socket portion of the garden tool;

(d) the intermediate section being oval-shaped in cross-section along substantially the entire length thereof and having a transition portion connecting the circular socket end to the oval-shaped section;



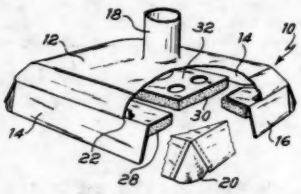
(e) the oval-shaped intermediate cross section with the major axis thereof in a plane to extend symmetrically through the longitudinal central axis of the socket portion when the socket end is disposed in the portion of the tool thereby being effective to facilitate handling of the tool.

4,639,030

PROCESS AND APPARATUS FOR THE LIFTING AND CARRIAGE OF OBJECTS PLACED ON TRAY-LIKE SUPPORTS

Anselmo Bini, 1, Via Sabatini, Chiesa Nuova di Monte San Pietro, Italy (20050)

Filed May 20, 1985, Ser. No. 735,873
Claims priority, application Italy, May 22, 1984, 21031 A/84
Int. Cl.[4] B65G *57/04*; B66C *1/02*
U.S. Cl. 294—64.1 **15 Claims**



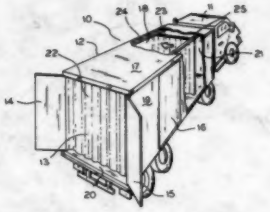
6. Apparatus for the lifting and carrying an assembly including objects arranged on a tray-like support, said apparatus comprising: a suction hood with an open bottom and movable side walls; means for placing the hood above the support and engaging said movable side walls with the edges of the support so that the support closes the bottom of the hood; means for applying a vacuum to the inside of the suction hood so that the support is urged toward the interior of the hood by atmospheric pressure; means for lifting and carrying the suction hood and the assembly from a start position to a final position while said vacuum is applied; and means for releasing the vacuum inside the suction hood when said support is in said final position.

4,639,031

REPOSITIONABLE THERMAL INSULATING TRUCK BULKHEAD

Randall Truckenbrodt, Western Springs, Ill., assignor to Randall Industries, Hinsdale, Ill.

Filed Apr. 17, 1985, Ser. No. 724,317
Int. Cl.[4] B62D *33/04*
U.S. Cl. 296—24 R **20 Claims**



1. Repositionable thermal barrier apparatus extendable between first and second sidewalls, said apparatus comprising:

a thermal barrier; and

means extendable between said first and second sidewalls for positioning said thermal barrier therebetween, said positioning means including a horizontal hanger bar from which said thermal barrier depends,

said hanger bar having first and second ends,

first and second means for supporting, respectively, said first and second ends of said hanger bar at said sidewalls,

said first support means including means for adjusting the position of said first hanger bar end along said first sidewall,

said adjusting means further including means to releaseably retain said adjusting means at selectable sites along said first support means,

said second support means further including means to releaseably attach said second hanger bar end at selected sites along said second sidewall,

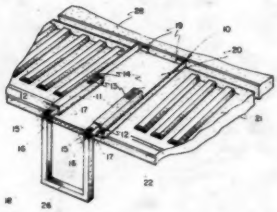
said attaching means being selectively detachable from said second support means to enable said second bar end to be selectively secured to said first support means at said first sidewall.

4,639,032

TAIL GATE STEP

Edward J. Barbour, Rte. 3, Box 299, Elizabethtown, N.C. 28337

Filed Nov. 1, 1984, Ser. No. 667,337
Int. Cl.[4] B60R *3/02*
U.S. Cl. 296—62 **8 Claims**



1. An improved step comprising: a pair of generally parallel guide means mounted on a vehicle; keeper means slidingly mounted within each said guide means; stop means mounted on one end of each said keeper means; U-shaped step means pivotally connected to said keeper means on the end opposite said stop means and so sized to retractingly slide within said guide

means for storage and to slidingly extend outwardly therefrom during use whereby an extensible and retractable step is provided.

4,639,033

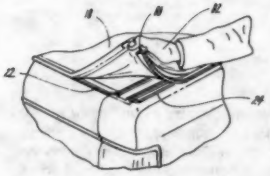
TONNEAU COVER

Donald G. Wheatley, and Patricia A. Wheatley, both of 4451 Ford Rd., Ann Arbor, Mich. 48105

Continuation-in-part of Ser. No. 650,275, Sep. 14, 1984, abandoned. This application Dec. 16, 1985, Ser. No. 809,167

Int. Cl.[4] B60J *7/10*

U.S. Cl. 296—100 **6 Claims**



1. Tonneau means for covering the cargo area of a vehicle, such as a boat, a pickup truck or the like, said vehicle having a pair of spaced sidewalls, each sidewall having a lower edge, comprising:

a flexible cover having a side edge, the cover being adapted to fit over the cargo area of the vehicle;

a rail having a horizontal upper wall and a depending vertical wall, the rail being disposed on the top of the sidewall;

a clamping member having a slot receiving the lower edge of the sidewall and the depending vertical wall of the rail;

a fastener member mounted on the clamping member for engaging both the sidewall and the vertical wall of the rail in the clamping member slot; and

means for releasably fastening the cover to the rail whereby the cover is connected to the sidewall without the necessity for forming any holes in the sidewall for the fastener member.

4,639,034

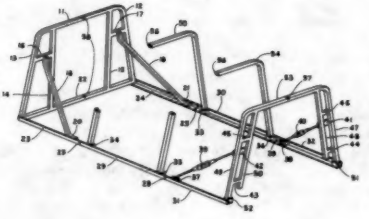
SOFT TOP FOR PICK-UP TRUCKS

James Amos, Muncie, Ind., assignor to American Insulation & Engineering Co., Inc., Muncie, Ind.

Filed May 6, 1985, Ser. No. 730,829

Int. Cl.[4] B62D *25/06*

U.S. Cl. 296—100 **9 Claims**



1. A collapsible top for pick-up truck cargo compartments, comprising:

(a) first and second girders mutually spaced in parallel alignment, each having first and second ends:

(b) a first end rafter permanently connected to said first ends of said girders, said first end rafter having an outer face and an inner face, said first end rafter having a top and bottom horizontal beam in parallel alignment, said top and bottom beams having first and second ends, said top beam being shorter than said bottom beam, said first end rafter being further provided with first and second ends, said top beam being shorter than said bottom beam, said first end rafter being further provided with first and second side supports connected to said first and second ends of said top and bottom beams, respectively, said first end rafter being further provided with first and second vertical supports connected to said top and bottom beams, said vertical supports being mutually spaced inwardly from said first and second side supports and being perpendicular to said top and bottom means, said first end rafter being further provided with first and second horizontal rods, said first horizontal rod being connected to said first side support and said first vertical support, said second horizontal rod being connected to said second side support and said second vertical support, said first end rafter being further provided with first and second girder sections connected to said inward face, said first girder section connected to said first end of said bottom horizontal beam being in perpendicular alignment therewith, said second girder section connected to said second end of said bottom horizontal beam being in perpendicular alignment therewith, said first end rafter being further provided with first and second struts, said first strut being connected to said first side support and said first girder section, said second strut being connected to said second side support and said second girder section, whereby a frame for a window is defined;

(c) a second end rafter removably connected to said second ends of said girders, said second end rafter having an inward and outward face, said second end rafter being provided with a top horizontal beam having first and second ends and corresponding in length to said first end rafter's top horizontal beam, said second end rafter further comprising first and second side supports, said first side support connected to said first end of said top beam and removably connected to said second end of said first girder, said second side support being likewise connected to said second end of said top horizontal beam and removably connected to said second end of said second girder, said second end rafter being further provided with first and second inner parallel side supports, said inner parallel side supports having first and second ends, said first end of said first inner parallel side support connected to said top horizontal beam inward from the connection of said first side support, said first inner parallel side support being parallel to said first side support, said first end of said second inner parallel side support connected to said top horizontal beam inward from the connection of said second side support to said top horizontal beam, said second inner parallel side support being parallel to said second side support, said second end rafter being further provided with first and second series of rungs, each rung having first and second ends, said first series of rungs having said first ends connected to said first side support and said second ends connected to said first inner parallel side support, said second series of rungs having said first ends connected to said second side support and said second ends connected to said second inner parallel support, whereby a frame for a door is defined;

(d) firt and second turnbuckles having first and second ends, said first end of said first turnbuckle being removably connected to said first girder and said second end of said first turnbuckle being pivotally connected to a first series rung, said first end of said second turnbuckle being removably connected to said second girder and said second end of said second turnbuckle being pivotally connected to a second series rung, whereby angular support for said second end rafter is defined;

(e) intermediate rafters removably connected to said girders, said intermediate rafter located between said first and second end rafters, said intermediate rafters being provided with top horizontal beams corresponding in length

to the top horizontal beams of the first and second end rafters and having first and second ends, said intermediate rafters being further provided with first and second side support members each having first and second ends, said first end of said first side support member being connected to said first end of said top horizontal beam and said second end of said first support member being removably connected to said first girder, said first end of said second support member being connected to said second end of said top horizontal beam and said second end of said second side support member being removably connected to said second girder, said intermediate rafters being parallel to each other as well as to the first and second end rafters;

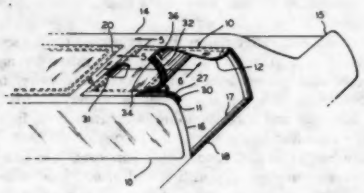
(f) architectural fabric removably covering said rafters, said fabric having window means located at said frame for a window and door means located at said frame for a door.

4,639,035

REMOVABLE LIGHTWEIGHT ROOF OPENING COVERS FOR VEHICLES

Jerry Isaacson, 8504 N. Central Park Ave., Skokie, Ill. 60076

Filed Nov. 14, 1983, Ser. No. 551,163
Int. Cl.[4] B60J *7/10, 7/12, 7/185*
U.S. Cl. 296—218 **10 Claims**



1. A removable, lightweight cover assembly for covering a vehicle roof opening of the type defined by a vehicle roof, the vehicle roof enclosing the opening on three sides and providing roof panel supporting means about the opening for supporting a vehicle roof panel and fastening means for securing the vehicle roof panel thereto, comprising:

a generally U-shaped frame adapted to cooperate with and be supported by and to be removably secured to the roof panel supporting means of the vehicle roof, said frame also enclosing on three sides said roof opening, said roof opening thus enclosed being continuous on a fourth side with a door opening,

said frame having latching means for cooperating with the fastening means of the vehicle roof for removably securing said frame to the vehicle roof in substantially leakproof relation, said frame further having cover attachment means for removably attaching a pliable, lightweight cover thereto, and

a cover of pliable, lightweight, weather-resistant material adapted to span said frame and extend at least to marginal edges thereof,

said cover having attachment means for cooperating with said cover attachment means of said frame for separably attaching said cover to said frame in substantially water and air resistant relation.

4,639,036

SUN SHADE APPARATUS FOR A LOUNGE CHAIR

James O. Nichols, 1805 Olive La., Plymouth, Minn. 55447

Continuation-in-part of Ser. No. 543,751, Oct. 20, 1983, abandoned. This application May 17, 1985, Ser. No. 735,398
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—184 **6 Claims**

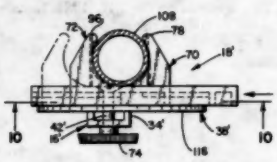
1. Sun shade apparatus for a chair comprising:

a frame;

a member for providing shade;

first means for attaching said shadeproviding member to said frame;

clamp means for pivotally holding said frame to said chair, said clamp means including first and second clamp elements, said clamp means further including a bearing member and second means for pivotally attaching together said first clamp element, said bearing member and said frame,



said first clamp element including means for retaining said second clamp element against said bearing member, said retaining means including means for moving said second clamp element linearly with respect to said first clamp element to releasably clamp said chair between said first and second clamp elements;

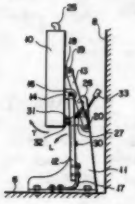
whereby said apparatus is adjustable at said first and second attaching means and said clamp means is clamped to and released from said chair by operating said moving means.

4,639,037

AUXILIARY SEAT ASSEMBLY FOR USE IN VEHICLES

Hidekazu Maruyama, 2-1-16 Shinmachi, Kokubunji-shi, Tokyo, and Kazuo Fujimaki, 403 Imajuku Nishi-cho, Asahi-ku, Yokohama-shi, Kanagawa-ken, both of Japan

Filed May 16, 1984, Ser. No. 610,713
Claims priority, application Japan, Jun. 16, 1983, 58-108058
Int. Cl.[4] A47C *4/00*
U.S. Cl. 297—334 **6 Claims**



1. An auxiliary seat assembly for use in a vehicle, comprising:

a base adapted to be securely fixed on a floor of the vehicle and having upper and lower portions,

a seat to be pivotally connected to the base and having upper, lower, front and rear sides, said seat, in use, being moved into a horizontal position where the upper side of the seat faces upwardly and said seat, out of use, being located in an upright position where the upper side thereof faces forwardly,

a first link member having a lower end pivotally connected to the lower portion of the base, and an upper end pivotally connected to the front lower side of the seat,

a second link having a lower end pivotally connected to the upper portion of the base, and an upper end pivotally connected to the seat,

means for preventing the second link from rotating downwardly beyond the horizontal position when the seat is in the horizontal position, said means being formed at the upper portion of the base,

a spring member situated between the base and at least one

of the first and second links to urge the seat to raise from the horizontal position to the upright position,

an engaging piece disposed at the rear side of the seat,

a hook situated at the upper portion of the base, said engaging piece engaging the hook when the seat is in the horizontal position to keep the seat in that position,

an engaging member connected to the lower side of the seat, and

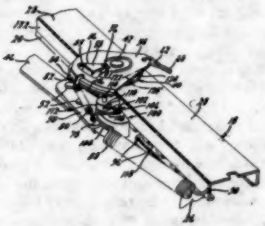
means for detachably engaging said engaging member, said engaging means being situated on one of the first and second links, said engaging member engaging the engaging means when the seat is in the upright position to securely place the seat in that position.

4,639,038

VEHICLE EASY ENTRY SEAT TRACK WITH ONE POSITION MEMORY

Dennis H. Heling, Canton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 2, 1985, Ser. No. 751,708
Int. Cl.⁴ B60N 1/04
U.S. Cl. 297—341 **5 Claims**



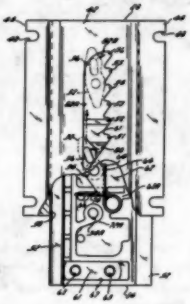
1. In a vehicle easy entry seat including a seat cushion and a seat back pivoted thereto by hinge means for pivotal movement between an upright position and a forward tilted position, an upper track member fixed to said seat cushion and a lower track member fixed on the vehicle for relative longitudinal movement of the seat cushion upper track on said lower track to a plurality of adjusted positions, said lower track member having a plurality of longitudinally spaced lock openings, a seat adjuster control mechanism comprising in combination; a latch plate formed with a locking detent pivotally mounted on said upper track member, first resilient means biasing said latch plate in a first rotational direction such that its locking detent is held in locked engagement with one of said lower track member openings, a pawl pivotally mounted on said latch plate, stop means on said latch plate positioning said pawl at either a first or second predetermined rotated position relative to said latch plate, second resilient means biasing said pawl in said first rotational direction into said first position, a cam member pivotally mounted on said latch plate, said cam member having means for engaging said pawl preventing rotation of said cam member in a second rotational direction when said pawl is positioned in its first rotated position, said cam member comprising a first planar wall portion and a second planar wall portion disposed in substantially normal relation to each other, third resilient means operative for biasing said cam member in either a first or second overcenter position, a lever member rotatably supported on said hinge means, link means connecting said lever member to said pawl, such that when said seat back is partially tilted forward said pawl is pivoted by said lever member to its second rotated position, wherein said cam member engaging means is moved out of contact with said pawl, and whereupon said seat back being tilted to its full forward position said latch plate and said pawl are pivoted in said second direction, whereby said locking detent is moved to its unlocked position out of engagement with its associated lower track member opening thereby allowing said upper track member to move forwardly on said lower track member to an easy entry or egress position, said third resilient means operative upon said engaging means on said cam member being moved out of contact with said pawl to rotate said cam member to its second overcenter position, whereby said cam member first planar wall portion is moved away from a position contacting a side wall of said upper track member and said second planar wall portion moved to a position slidably engaging said upper track member side wall so as to maintain said locking detent in its unlocked position during longitudinal movement of said upper track member, and camming means on said lower track member operative to engage said cam member upon said upper track member being moved rearwardly to a predetermined location, and wherein said cam member is rotated in said first direction for return to its first overcenter position allowing said first resilient means to rotate said locking plate in said first direction such that said locking detent engages a predetermined single-position memory opening in said lower track with said cam member first planar wall portion again in flush contact with said upper track member side wall, while said second resilient means rotates said pawl in said first direction to its first position whereby said cam member engaging means again engages said latch plate.

4,639,039

HEIGHT ADJUSTMENT MECHANISM FOR CHAIR BACKREST

Kyle P. Donovan, Brown Deer, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Sep. 10, 1985, Ser. No. 774,447
Int. Cl.⁴ A47C 7/46
U.S. Cl. 297—353 **8 Claims**



1. An adjustment mechanism (12) mountable on a chair (10) for releasably locking one chair component (22) in any one of a plurality of positions relative to another chair component (20) and relative to a support (18) which is part of the chair (10), comprising:

a guide member (24) which is adapted to be rigidly secured to said support (18);

a channel member (28) which is adapted to be rigidly secured to said one chair component (22) and which is mounted on said guide member (24) for sliding movement between two extreme positions; and

latching means for releasably latching said channel member (28) and said one chair component (22) secured thereto in either of said two extreme positions or in intermediate positions therebetween in response to manual movement of said one chair component (22);

said latching means comprising a slot (38) on said channel member (28), said slot (38) having a plurality of notches (51–56) along one side, an inclined cam surface (80) along one end, a curved cam surface (82B) along the other end, and an intermediate cam surface (82A) along the other side; a latch bar (32) mounted on said guide member (24) for pivotal movement in a plane parallel to a plane in which said slot (38) lies and having a latch pin (36) thereon extending transversely into and remaining in said slot (38);

and biasing means (40) connected between said guide member (24) and said latch bar (32) for biasing said latch bar (32) and latch pin (36) thereon alternately in a latched position wherein said latch pin (36) engages a notch (51-56) or an unlatched position wherein said latch pin (36) engages one of said cam surfaces (80, 82A, 82B);

said one chair component (22) being manually movable in one direction when said latch bar (32) is in latched position to move said latch pin (36) out of engagement with one notch and into engagement either with an adjacent notch or with said inclined cam surface (80) so that said latch bar (32) is moved from latched to unlatched position by said inclined cam surface (80);

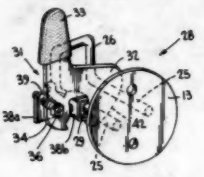
said one chair component (22) also being manually movable in an opposite direction when said latch bar (32) is in unlatched position to move said latch pin (36) from said inclined cam surface (80), along said intermediate cam surface (82A) and along said curved cam surface (82B) so that said latch bar (32) is moved from unlatched to latched position by said curved cam surface (82B).

4,639,040

FIXING DEVICE FOR A VEHICLE SEAT

Yasuyuki Fujita, and Takaichi Nishino, both of Tokyo, Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 489,785, Apr. 29, 1983, abandoned. This application Nov. 19, 1985, Ser. No. 799,606
Claims priority, application Japan, Apr. 30, 1982, 57-64704
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—379 **1 Claim**



1. A fixing device for a vehicle having a forwardly foldable seat back, comprising a support element adapted to be mounted to a side wall of the vehicle opposite an upper portion of the vehicle seat back, and a hook element engageable with said support element for locking said seat back relative to said side wall, said support element comprising a base plate for mounting said support element in place, a substantially horizontal set part affixed at one end to said base plate, and a slip-off preventing extension extending upwardly from the other end of said set part, said extension and said set part comprising a single, bent, rigid wire, a bolt rigidly secured to said upper portion of said seat back and extending outwardly thereof, said hook element being mounted on said bolt for pivotal movement about the axis thereof, said hook element comprising a plate having a hook part engageable with said set part, and an operative part for manually pivoting said hook element, a bracket fixedly secured to said upper portion of said seat back, said bracket having one leg with an opening through which said bolt extends for fixing said bracket in place, and said bracket having another leg lying parallel to said set part of said support element, cushioning material affixed to said another leg and abutting against said set apart for preventing a rearward folding of said seat back and for cushioning engagement between said hook element and said support element, said another leg having an edge confronting said slip-off preventing extension for engagement therewith upon the application of external rearward and forward forces against said seat back for thereby preventing said hook element from slipping off said set part.

4,639,041

HEADREST MOUNTING STRUCTURE FOR A VEHICLE SEAT

Toshio Furukawa, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,442
Claims priority, application Japan, Jul. 31, 1984, 59-118945[U]
Int. Cl.[4] A47C *7/36*
U.S. Cl. 297—391 **2 Claims**

1. A headrest mounting structure for a vehicle seat in which there are provided a pair of spaced-apart headrest stays for supporting a headrest on a seat back of the vehicle seat with the seat back extending generally in a selected plane transversly of said vehicle, comprising:

a pair of brackets each having an upper plate and a lower plate, said brackets being fixed to a seat back frame of said vehicle seat in a spaced-apart relationship with each other, each of said upper and lower plates being formed with an elongated insertion bore having a straight-line portion which extends in a transverse direction generally parallel of said selected plane of said seat back; and

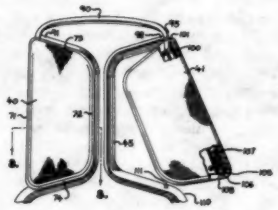
a pair of support tubes to be respectively inserted into said elongated insertion bores of said brackets, each of said support tubes having an insertion bore formed co-axially therewithin, said insertion bore being of an elliptical shape in section and including a straight-line portion which extends in a transverse direction generally parallel to the selected transverse plane of said seat back, and further each of said support tubes comprising a head portion to be abutted against the upper end of said seat back and a leg portion to be inserted through said elongated insertion bores of said brackets, said leg portion being so formed as to have a circular shape in section such that said tubes may be displaced to the right or to the left from the center of said insertion bores of said brackets, whereby said pair of headrest stays are respectively inserted into said insertion bores of said support tubes.

4,639,042

CHAIR BACK ARRANGEMENT

Gerd Lange, Kapsweyer, Fed. Rep. of Germany, assignor to Fixtures Manufacturing Corporation, Kansas City, Mo.

Filed May 21, 1985, Ser. No. 736,457
Int. Cl.[4] A47C *3/04*
U.S. Cl. 297—444 **9 Claims**



1. A chair comprising:

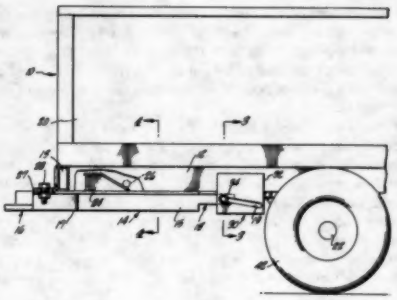
(a) a seat and support means;
(i) said support means orienting said seat for engagement by a person sitting on said chair;
(b) a chair back including a front side and having a frame and back panel means;
(i) said chair back having an upper edge, first and second outer side edges and a center portion;
(ii) said chair back frame including a first extension member and a second extension member;
(iii) said first extension member having an upper lateral extension, a lower lateral extension and a central, substantially vertical, portion; said first extension member being mounted in said chair, to form a portion thereof, by said first extension member lower lateral extension;
(iv) said second extension member having an upper lateral extension, a lower lateral extension and a central, substantially vertical, portion; and said second extension member being mounted in said chair, to form a portion thereof, by said second extension member lower lateral extension;
(c) said first extension member central, substantially vertical, portion being aligned with and laterally spaced from said second extension member central, substantially vertical, portion, forming a ventilation space between said first and second extension members and positioned in said center portion of said chair back;
(d) said back panel means including first and second laterally spaced back panels;
(i) said first panel being trapezoid-like in configuration and having: front and back sides; an inner edge; a longer, outer edge; and, first and second opposite and substantially equivalent side edges;
(ii) said first extension member having said first panel mounted thereon: with said first extension member central, substantially vertical, portion engaging said first panel inner edge; with said first extension member upper lateral extension engaging said first panel first side edge; and, with said first extension member lower lateral extension engaging said first panel second side edge;
(iii) said first panel outer edge forming a side edge of said chair back;
(iv) said second panel being trapezoid-like in configuration and having: front and back sides; an inner edge; a longer, outer edge; and, first and second opposite and substantially equivalent side edges;
(v) said second extension member having said second panel mounted thereon: with said second exteions member central, substantially vertical, portion engaging said second panel inner edge; with said second extension member upper lateral extension engaging said second panel first side edge; and, with said second extension member lower lateral extension engaging said second panel second side edge;
(vi) said second panel outer edge forming a side edge of said chair back;
(vii) said second panel inner edge extending generally along and spaced apart from said first panel inner edge, forming a ventilation space therebetween; and
(e) said first and second panels having a space therebetween and cooperating to form said chair back, against which a person sitting in said chair may lean, said space between said first and second panels corresponding to said ventilation space;
(f) whereby said chair back has a centrally positioned ventilation space therein for facilitating comfort of a person sitting in said chair; and
(g) whereby each of said panels is securely mounted within said chair by each one of said extension members engaging three sides of one of said panels.

4,639,043

SELF-DUMPING TRAILER

Richard W. Morissette, 3476 Gilham Rd., Eugene, Oreg. 97401

Filed Nov. 27, 1984, Ser. No. 675,358
Int. Cl.[4] B60P 1/12
U.S. Cl. 298—5 **4 Claims**



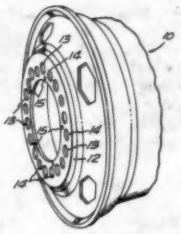
4. A trailer for towing behind a vehicle comprising, a rotatable frame having a negatively inclined slot therein, a yoke slidably attached to said frame slot, an inclined ramp connected to said yoke, a roller connected to said frame and positioned for engagement with said ramp, said ramp being configured to rotate said frame during yoke sliding, and said slot being angled to permit frame rotation free from interference from said yoke.

4,639,044

DEMOUNTABLE WHEEL

Max L. Enders, deceased, late of South El Monte, and by Reinhard A. Thiel, administrator, Corona, both of Calif., assignors to William Douglas Sellers and George A. Brace, both of Pasadena, Calif.

Continuation of Ser. No. 090,550, Nov. 2, 1979, abandoned. This application May 18, 1981, Ser. No. 265,189
Int. Cl.[4] B60B 1/00, 27/00
U.S. Cl. 301—9 DN **4 Claims**



1. A pair of demountable vehicle wheels mountable interchangeable with either wheel innermost either on (1) an axle hub equipped with a ring of threaded cylindrical studs fixedly mounted therein each having a lug nut provided with a semispherical inner end and on (2) an axle hub equipped with a ring of threaded studs fixedly mounted therein having an exposed tapered length nearly as great as the combined thickness of the respective hubs of said pair of wheels which tapered studs each have a lug nut and a collet ring which ring has converging inner and outer surfaces tapered similarly to said tapered studs, each of said wheels having:
a hub;
a first ring of bores about the axis of said wheel hub sized and positioned to telescope loosely over an axle hub equipped

with said threaded cylindrical studs which bores are provided with semi-spherical recesses to seat the similarly contoured end of a lug nut mounted on the outer end of said threaded cylindrical studs;

a second ring of bores about the axis of said wheel hub tapered similarly to said tapered studs and sized and positioned to telescope over an axle hub equipped with said tapered studs;

the tapered bores of a first one of said wheels being adapted to have a snug metal-to-metal fit with the larger inner ends of said tapered studs with the smaller outer ends thereof projecting outwardly beyond the outer side of said wheel hub for a distance somewhat less than the thickness of said wheel hub;

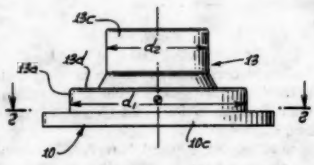
a second one of said wheels being invertable with its tapered bores flaring outwardly and adapted to be telescoped loosely over the smaller outer ends of said tapered studs and clamped rigidly thereto by lug nuts wrenched onto said tapered studs and against said collet rings having inner and outer surfaces tapered similarly to said tapered bores and said tapered studs whereby said collet rings have metal-to-metal contact with said studs and with the tapered bores of said second wheel when said lug nuts are wrenched tight.

4,639,045

TRUCK WHEEL LUG NUT PROTECTOR APPARATUS

Timothy J. Kane, 1200 Greenfield, Arcadia, Calif. 91006

Filed Oct. 29, 1985, Ser. No. 793,328
Int. Cl.[4] B60B *7/02, 7/06*
U.S. Cl. 301—37 S **5 Claims**



1. In protection apparatus for studs and lug nuts on a truck wheel, and in combination therewith, the nuts spaced about a central wheel axis and attached to bolts, the combination comprising

(a) two clips retained to the wheel, each clip including a base retained to the wheel by two lug nuts, and a flange extending outwardly away from the base and in spaced relation to said nuts, and

(b) a cover having a skirt removably attached to said flanges, said skirt protectively surrounding all of said lug nuts and bolts,

(c) there being at least eight of said lug nuts on at least eight of said studs, each base comprising a plate having two through openings passing two of said studs, the two clips respectively located at diametrically opposite sides of said axis,

(d) said cover including a first portion defining said skirt which is annular and has an outer diameter d_1 and said cover having a cap portion attached to said first portion and projecting axially at one side thereof, said cap portion having a diameter d_2 which is substantially less than d_1,

(e) said skirt extending further from said axis than each flange but extending in generally side-by-side relation with each said flange in substantially perpendicular relation to the wheel, and each said flange is located at a radius from said axis which exceeds the radii of said studs and nuts, from said axis,

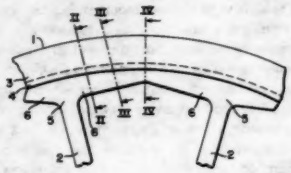
(f) the skirt having a rim proximate an annular surface defined by the wheel, and extending radially outwardly of the base defined by each clip, and adjacent the clip flange.

4,639,046

INJECTION MOLDED SYNTHETIC WHEEL

Werner Oleff, Ruscherstr. 13, D-4972 Löhne 3, and Fritz G. Pape, Porta Westfalica, both of Fed. Rep. of Germany, assignors to Werner Oleff, Löhne and ASV Stübbe GmbH & Co KG, Vlotho, both of, Fed. Rep. of Germany, a part interest

Filed Mar. 14, 1984, Ser. No. 589,458
Int. Cl.[4] B60B *5/04*
U.S. Cl. 301—63 PW **1 Claim**



1. A wheel of synthetic material, comprising a hub and spokes and a rim,

said rim including main rim walls having a predetermined rim cross section and being unitary with said spokes at spoke connection locations on said rim, said hub being unitary with said spokes and being the injection-molding center part of the wheel, the improvement therewith which comprises:

said rim being provide with a plurality of circumferentially extending additional rim wall elements of synthetic material between all of said spokes,

each of said wall elements leading from said spoke connection location of a given spoke to the middle of a rim portion located between two adjacent spokes and each of said wall elements being designed, in comparison with said main rim walls with respect to the rheological cross-sectional area thereof, with an advance-flow cross-sectional area,

the synthetic material in each of said wall elements at the middle of said rim portion, where two of said wall elements join one another, and the synthetic material in said main rim walls of said rim portion between said two adjacent spoke connection locations being free from cold flow seams,

in which each of said wall elements is a rim element connected to said spokes and which projects radially inwardly from a surface of said rim and has two ends, one of which merges with said connection location of a given spoke, and the other of which merges in the middle of a rim portion with an end of another rim element extending from an adjacent spoke,

in which each of said rim elements has a radially outwardly disposed circumferential edge which merges with said remaining rim walls, and which has a varying cross-sectional width which steadily decreases in the direction from the middle of a rim portion toward a spoke.

4,639,047

RAILWAY VEHICLE BRAKE SYSTEM WITH IMPROVED BLENDING CONTROL OF PNEUMATIC AND ELECTRIC BRAKES

Asaji Imanaka, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Apr. 8, 1985, Ser. No. 720,670
Claims priority, application Japan, Apr. 13, 1984, 59-55311[U]
Int. Cl.[4] B60T *13/70, 75/54*
U.S. Cl. 303—15 **10 Claims**

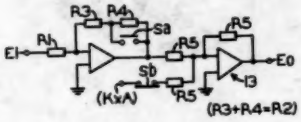
1. A brake control system for a railway vehicle having an electric brake system and a fluid pressure brake system, said brake control system comprising:

(a) means for providing a brake command signal according to the desired total brake power of said vehicle;

(b) said electric brake system being operative in response to said brake command signal to provide vehicle brake power;

(c) means for providing a feedback signal corresponding to the effective vehicle brake power provided by said electric brake system;

(d) an electrical amplifier circuit having one input subject to said feedback signal, another input subject to a bias signal, and an output providing an output signal, said output signal being derived from said feedback signal and said bias signal at a first amplification ratio in a first operating condition of said amplifier circuit and being derived from said feedback signal alone at a second amplification ratio in a second operating condition of said amplifier circuit;



(e) operator means for subtracting said output signal of said amplifier circuit from said brake command signal to provide a difference signal;

(f) said fluid pressure brake system being operative in response to said difference signal to provide supplemental brake power; and

(g) detector means operative in response to a drop in said electric brake feedback signal for causing said amplifier circuit to change from said first operating condition to said second operating condition, such that the total brake power of said vehicle corresponds substantially to said brake command signal during and following the transition from said electric brake system to said fluid pressure brake system.

4,639,048

PROCESS AND APPARATUS FOR BRAKE PRESSURE CONTROL

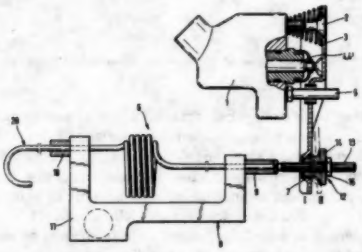
Bernd Schopper, Hattersheim, and Peter Tandler, Falkenstein, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 15, 1985, Ser. No. 734,582

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3418041

Int. Cl.[4] B60T *8/18*

U.S. Cl. 303—22 R **17 Claims**



1. A brake pressure control unit for a pressure medium-actuable vehicle brake unit, which brake pressure control unit is load-sensitively controllable by an adjustable spring device and is equipped with at least one valve having a control piston pressure-sensitively slidable into a closing position against the force of the spring device, said spring device pivotally connected to a swivelling transmission lever, means for the preadjustment of the change-over point where pressure control is initiated by said brake pressure control unit, said preadjustment means comprising first stop means formed on said spring device and pivotally connected to said transmission lever, second stop means fastened to said spring device at a distance from said first stop means, and a removable spacing means in the shape of a distance gauge interposed between the said stop means and by which a distance of the said two stop means corresponding to a determined amount of preload of the spring is adjusted.

8. A process for the preadjustment of the change-over point of a brake pressure control unit of a pressure medium-actuatable vehicle brake unit, which said brake pressure control unit is load-sensitively controlled by an adjustable spring device and is equipped with at least one valve with a control piston being pressure-sensitively slidable into closing position against the force of the spring device, said spring device being pivotably connected to a swiveling transmission lever, in which the transmission lever is moved between two defined positions, a first position being defined by the closing position of the valve and a second position defined by the opening position of the valve, said process comprising the steps of: pivoting said spring device; applying a defined force to the free end of said spring device to prestress said spring device, stationarily fixing said free end of said spring device relative to said transmission lever while said transmission lever is in said first position to close said valve, bringing said transmission lever to said second position to open said valve, and fixing the length of said prestressed spring device.

4,639,049

MODULAR FURNITURE

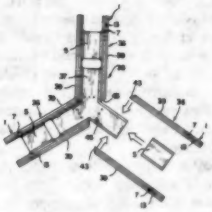
Francesco Frascaroli, and Carlo Biondi, both of Bologna, Italy, assignors to C.O.M. Cooperativa Operai Metallurgici S.C.R.L., Bologna, Italy

Filed Apr. 18, 1984, Ser. No. 601,854

Claims priority, application Italy, Apr. 22, 1983, 4850/83[U]

Int. Cl.[4] A40B *45/00*

U.S. Cl. 312—195 **17 Claims**



1. Modular apparatus for combining into functional and esthetically pleasing office work stations and for managing electrical wires comprising:

(a) a plurality of generally horizontal beam members, each beam member including at least one plate interposed between and rigidly joined to a pair of laterally spaced substantially parallel beams;

(b) a plurality of connecting means for longitudinally rigidly connecting the respective beams of adjoining beam members into a selected overall length to suit an office space;

(c) at least two vertical support means for rigidly supporting the beam members at selected locations thereon;

(d) at least one work surface; and

(e) bracket means for rigidly mounting the work surface to the beam members at selected locations thereon,

so that the work surface and vertical support means may be rigidly connected to the beam members at selected locations thereon to create a great number of patterns to suit the office work and personnel requirements and wherein

the beams are fabricated as generally rectangular tubes having top and bottom walls, each top and bottom wall being formed with a longitudinal depression in the exterior thereof, each top and bottom wall defining a plurality of aligned longitudinally spaced slots, the depressions and slots being adapted to receive and cooperate with the bracket means for rigidly mounting the work surface to the beam members.

4,639,050

TRASH PAIL FOR INSTALLATION IN A CABINET HAVING A SWINGABLE DOOR

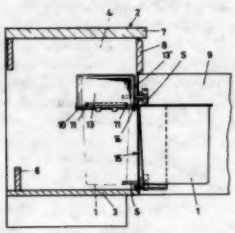
Josef Neuhaus, Arnsberg, Fed. Rep. of Germany, assignor to Westermann Kommanditgesellschaft, Arnsberg, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,905

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327614

Int. Cl.⁴ A47B *77/18*

U.S. Cl. 312—273 **9 Claims**



1. In a system comprising a trash pail for installation in a cabinet having a cabinet wall and swingable door, the improvement comprising

a support,

the trash pail being removably suspended in a vicinity of an upper edge thereof on said support, said support being pivotally fastened to said cabinet wall around a vertical axis and operatively coupled to said door, the pail, upon turning the support around said vertical axis upon opening the door, being swung out from inside of the cabinet,

said support comprises an angle member having two arms, said arms extend horizontally substantially 90° with respect to each other forming an angular space with respect to each other,

said trash pail is formed with a corner part of a wall surface of the trash pail, said corner part being of non-circular plan cross section and being supported within said angular space against said arms complementarily form-locking said trash pail thereon said upper edge of said trash pail forms a rim,

said angle member has as upper end edge of said arms of said angle member,

the rim of the trash pail is removably suspended over the upper end edge of said arms of said angle member forming said complementary form-locking.

4,639,051

TURN-OUT SHELF ASSEMBLY FOR A CABINET

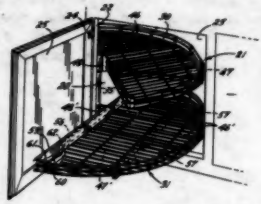
William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Mar. 25, 1985, Ser. No. 715,881

Int. Cl.⁴ A47B *81/00*

U.S. Cl. 312—275 **3 Claims**

1. A rotary shelf assembly for a cabinet having a front opening and having a vertically extending door hinged adjacent one side of said opening to swing between closed and open positions about a vertical axis, said shelf assembly comprising a vertically extending post, means supporting said post within said cabinet to turn about a vertical axis located adjacent said one side of said opening and offset rearwardly from the axis of said door, an upper shelf supported on said post to turn in unison with said post about the axis of the post between stored and accessible positions, a lower shelf supported on the post to turn relative to the post about the axis of the post between stored and accessible positions, each shelf being located within the cabinet when the shelf is in its stored position and being at



least partially located outside of the cabinet when the shelf is in its accessible position, means connecting said door to said lower shelf for causing said lower shelf to turn automatically between its stored and accessible positions as said door is swung between its closed and open positions, and releasable means holding said post against rotation when said lower shelf is turned while permitting rotation of said post when said upper shelf is turned.

4,639,052

DRAWER FOR A STORAGE CABINET

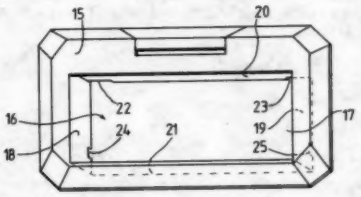
Patrick P. P. Posso, Lausanne, Switzerland, assignor to Gefitec S.A., Lausanne, Switzerland

Filed May 15, 1985, Ser. No. 734,470

Claims priority, application France, May 22, 1984, 84 07952

Int. Cl.⁴ A47B *88/04*

U.S. Cl. 312—333 **4 Claims**



1. A drawer for a storage cabinet with a keeper and formed of moulded synthetic plastics material, comprises a front rectangular housing having a rectangular opening for receiving a locking device, an auxiliary locking device for securing said drawer to said storage cabinet including a support of general rectangular shape and dimensions substantially identical to that of the opening, and a lock supported on a front face of said support, said lock including a bolt extending in parallel to the front face and rotatable between a first and a second position, the support comprising, on at least two of its opposed sides, projecting parts, and the housing comprising on at least two of its opposed walls cut-outs, the projecting parts of the auxiliary locking device support engaging and locking into the cut-outs; said bolt engaging said keeper in the first position, and being disengaged from said keeper in the second position.

4,639,053

CONNECTOR FOR A SHIELDED FLAT CABLE

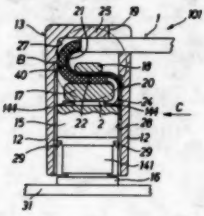
Manfred Reichardt, Weinsberg, and Gunter Schutzle, Heilbronn, both of Fed. Rep. of Germany, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 12, 1985, Ser. No. 797,342

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441818

Int. Cl.[4] H01R 4/66

U.S. Cl. 339—14 R 18 Claims



1. A connector for a flat cable having shield means, said connector comprising:

a connector housing;

an insulating body adapted to be placed in said connector housing;

said insulating body having a cable termination side and a connector receiving side;

a plurality of contacts arranged in said insulating body;

said contacts comprising at their end located at the cable termination side contact means for the displacement of the insulation of the flat cable;

cable holding means for holding the flat cable in engagement with said insulation displacement contact means and adapted to be mounted on the insulating body;

cable strain relief means adapted to urge the flat cable which is guided in a U-shaped manner about the cable holding means against the upper side of the cable holding means; and

grounding sheet metal means adapted for contacting said shield and for connecting it with a grounded component of the connector;

characterized in that the grounding sheet metal means if formed and arranged in the connector housing in such a manner that the shield at one wide side of the flat cable is directly contacted by said grounding sheet metal means and is connected by means of said grounding sheet metal means to a grounded component of the connector; and

that the grounding sheet metal means urges the shield at the other wide side of the flat cable against a grounded component of the connector.

4,639,054

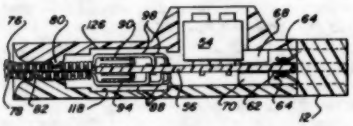
CABLE TERMINAL CONNECTOR

Mark D. Kersbergen, Longmont, Colo., assignor to Intelligent Storage Inc., Longmont, Colo.

Filed Apr. 8, 1985, Ser. No. 721,238

Int. Cl.[4] H01R 9/09, 13/70

U.S. Cl. 339—14 R 3 Claims



1. A cable terminal capable of connecting a first woven ribbon cable and a second woven ribbon cable to a standardized terminal connector and selectively interconnecting said first and second woven ribbon cables comprising:

switch means for selectively interconnecting said first and second woven ribbon cables;

first mass ground terminator means for conductively connecting ground wires of said first woven ribbon cable by simultaneously physically securing and electrically connecting said ground wires to said first mass ground terminator means;

second mass ground terminator means for conductively connecting ground wires of said second woven ribbon cable by simultaneously physically securing and electrically connecting said ground wires to said first mass ground terminator means;

printed circuit board means comprising:

first signal connector means for connecting signal wires of said first woven ribbon cable means to a first side of said printed circuit board means, said first signal connector means having connector opening means for connecting each of said signal wires of said first woven ribbon cable to separate openings on said first side of said printed circuit board means and each of said signal wires of said second woven ribbon cable to separate openings on a second side of said printed circuit board means such that said signal wires are physically secured and electrically connected to said printed circuit board means to allow rapid connection and repair of said cable terminal;

second signal connector means for connecting signal wires of said second ribbon cable means to said second side of said printed circuit board means, said second connector means having connector opening means for connecting each of said signal wires of said first woven ribbon cable to separate openings on said first side of said printed circuit board means and each of said signal wires of said second woven ribbon cable to separate openings on said second side of said printed circuit board means such that said signal wires are physically secured and electrically connected to said printed circuit board means to allow rapid connection and repair of said cable terminal;

first ground connector means for connecting said first mass ground terminator means to said first side of said printed circuit board means;

second ground connector means for connecting said second mass ground terminator means to said second side of said printed circuit board means;

switch connector means for connecting said switch means to said printed circuit board means;

pad contact means for providing a conductive connection between said printed circuit board means and said standardized terminal connector;

printed circuit board conductor means conductively connected to said first and second signal connector means, said first and second ground connector means, said switch connector means and said pad contact means such that said signal wires and ground wires of said first and second woven ribbon cables are connected to predetermined pad elements of said pad contact means and said switch means is capable of selectively interconnecting said signal wires of said first and second woven ribbon cables;

housing means for providing a cover for said cable terminal comprising:

releasable connector means for joining portions of said housing means to allow said housing means to be disassembled for repair of said cable terminal;

catch means disposed on said housing means;

mounting means for mounting said switch means;

teeth means disposed to engage said first and second woven ribbon cables along transverse raised portions of said first and second woven ribbon cables resulting from weaving of said cables to provide strain relief

between said printed circuit board means and said first and second woven ribbon cables; and,

support means for securing said printed circuit board means to said housing means.

4,639,055

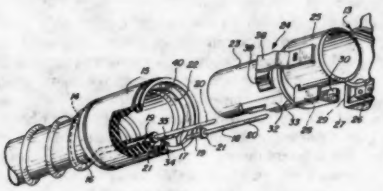
HOSE COUPLING FOR VACUUM CLEANER

James W. Keane, Ramsey County, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 3, 1985, Ser. No. 740,624

Int. Cl.[4] H01R 3/00

U.S. Cl. 339—16 R **12 Claims**



1. In a current-carrying vacuum cleaner air hose having electrical conductors extending lengthwise thereof, an end provided with a cuff, said conductors having ends at said cuff end, and a tubular adapter connected to said cuff and defining means for connecting the hose end and conductor ends to a coupling element to provide an air flow connection and an electrical connection therebetween, the improvement comprising:

a pair of separate contact pins removably mountable on said cuff end respectively in electrically conductive association with said conductor ends and projecting through said adapter to define electrical connection means for electrical connection to said coupling element;

guide means on said adapter for guiding said pins into electrical connection to said coupling element as an incident of the adapter being associated with the coupling element to have air flow connection therebetween; and

means on said adapter for retaining said pins separately in said electrically conductive association with said electrical conductors as a result of said adapter being connected to said cuff.

4,639,056

CONNECTOR CONSTRUCTION FOR A PC BOARD OR THE LIKE

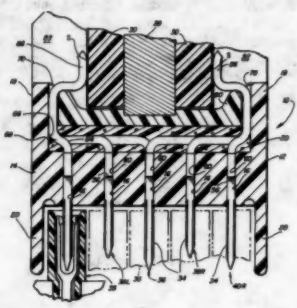
Richard J. Lindeman, Wood Dale, and Thaddeus M. Rachwalski, Wheaton, both of Ill., assignors to TRW Inc., Redondo Beach, Calif.

Filed May 31, 1985, Ser. No. 740,093

Int. Cl.[4] H01R 9/09, 13/405

U.S. Cl. 339—17 LC **13 Claims**

1. In a connector for mounting a circuit board thereon, the combination comprising an apertured insulator having opposed sidewalls; a plurality of contacts mounted in apertures of said insulator in a plurality of spaced longitudinal rows arranged at intervals across the width of said insulator; said contacts having first terminal portions projecting from a first surface of said insulator for engaging contacts of a mating connector; second contact portions contiguous with said contact first terminal portions and disposed above a second surface of said insulator opposed to said first surface; said second contact portions being in spaced-apart relation; rigid, electrically non-conductive means in which said second contact portions are disposed secured to the second surface of said insulator; third contact portions contiguous with said second contact portions arranged in parallel, non-contacting relation along at least one of said insulator side-walls; continuations of said third contact portions terminating in contact portions for engaging conductive paths on a circuit board; all portions of each contact being integrally formed; and reinforcing means for supportably mounting a circuit board and for preventing bending of said insulator transverse to its longitudi-



nal axis fixedly mounted in said electrically non-conductive means; said contact second portions, electrically non-conductive means, reinforcing means and insulator defining a rigid assembly resistant to bending.

4,639,057

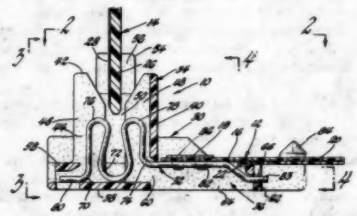
ELECTRICAL CONNECTOR FOR PRINTED CIRCUITS

Ronald E. Daum, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 6, 1985, Ser. No. 708,788

Int. Cl.[4] H01R 9/07, 9/09

U.S. Cl. 339—17 F **10 Claims**



1. An electrical connector for connecting a flexible printed circuit to an end tab of a printed circuit board, comprising:

a dielectric connector body having a socket portion and a trailing attachment portion,

said socket portion having a base, an upright end wall at the trailing end of the base and a plurality of spaced partition walls which are integrally connected to the base and the end wall to define a row of terminal cavities which have interconnected openings at the leading end and the top of the socket portion,

a row of aligned slots in the respective partition walls which are open at the top of the socket portion for receiving an end tab of a printed circuit board in the row of terminal cavities,

a lock nib extending into each terminal cavity near the base and the opening at the leading end, and

an exit aperture for each terminal cavity extending through the end wall near the base,

said trailing attachment portion having an outrigger spaced from the trailing end of the base of the socket portion and connected thereto solely by a pair of integral side extensions to provide an open span between the socket portion and the outrigger, and

a row of apertures extending through the outrigger aligned

with the respective exit apertures of the terminal cavities, and

a plurality of contact strips associated with the respective terminal cavities, exit apertures, and outrigger apertures, each said contact strip having a locking portion at one end which cooperates with the lock nib of a terminal cavity to retain the contact strip in an operative position,

an intermediate resilient clip portion which is disposed in the terminal cavity for engaging the end tab of the circuit board when it is inserted into the socket portion, and

an elongated portion at the other end which extends through the exit aperture of the terminal cavity and the outrigger aperture associated with the terminal cavity so that the elongated portion extends across the open span between the socket portion and the outrigger for connection to a flexible printed circuit.

4,639,058

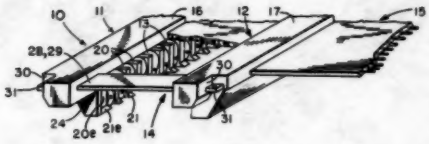
LOW PROFILE TEST CLIP AND HANDLE THEREFOR

Thomas E. Morgan, Concord, Ohio, assignor to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Filed Aug. 22, 1984, Ser. No. 643,237

Int. Cl.[4] H01R *4/66, 13/62*

U.S. Cl. 339—17 CF **20 Claims**



1. A low profile clip connector, comprising an electrical cable including plural electrical conductors; a pair of electrically non-conductive clip bodies molded to said cable, each body including therein plural electrical contacts having first portions electrically connected to said electrical conductors of said cable and second portions exposed for engaging the leads of an electrical device, and each body including electrically non-conductive separator walls laterally spaced apart and positioned to separate said second portions of said contacts from one another, said separator walls having a spacing and width that permits positioning thereof between the leads of the electrical device; and coupling means for coupling said pair of bodies with respect to each other for mounting of the clip connector on such electrical device to enable said contacts at their second portions to connect with the leads of the electrical device; and each clip body further including therein metal reinforcement means extending substantially the lateral extent of said separator walls for ridigfying said clip body along its lateral length.

4,639,059

CONNECTION DEVICE FOR ELECTRICAL COMPONENT

Claude Thepault, Milan, Italy, assignor to Crouzet S.p.A., Milan, Italy

Filed Aug. 29, 1985, Ser. No. 770,706

Claims priority, application Italy, Sep. 5, 1984, 22525 A/84

Int. Cl.[4] H01R *9/09*

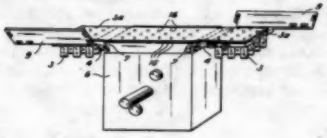
U.S. Cl. 339—17 F **4 Claims**

1. A connection interface between an electrical component and other electrical circuit elements, comprising:

means forming a plurality of contact points on a side of said component;

at least one flexible printed circuit board affixed intermediate its length to said side of said component and electrically connected to said contact points in accordance with a selected connection arrangement, said printed circuit board having ends extending beyond said component on opposite sides thereof;

a respective flat preformed rigid body mounted on each of said ends and electrically connected to said printed circuit board along one side of each of said bodies in accordance with a selected connection arrangement, an opposite side of each preformed body being formed with terminals connectable to said elements, said bodies being foldable



over said side of said component provided with said contact points whereby said preformed bodies are generally in a coplanar relationship and said terminals project away from said component;

a slotted part hingedly connected to each of said bodies and receiving a ridge formed in said component adjacent the side provided with said contact points to enable said bodies to fold to overlie said side provided with said contact points; and

means for retaining said bodies in said coplanar relationship.

4,639,060

HEAT RECOVERABLE CONNECTOR

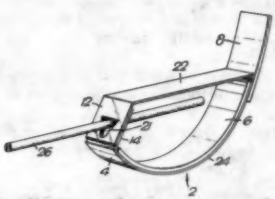
Richard Lionnet, Parmain, France, assignor to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 30, 1984, Ser. No. 605,513

Claims priority, application United Kingdom, May 20, 1983, 8314008

Int. Cl.[4] H01R *4/24*

U.S. Cl. 339—30 **19 Claims**



1. A connector for making an electrical connection to the conductor of an elongate insulated electrical conductor comprising contact members that are electrically conductive at least in part and which co-operate to form an aperture for receiving the insulated conductor, the connector being heat recoverable to urge the members together along the axis of the conductor and to effect relative slidable movement of the members so that the aperture is reduced in size in such a way that at least one of the members defining the reduced size aperture pierces the conductor insulation and the members exert a permanent gripping force on the conductor.

4,639,061

ENVIRONMENTALLY SEALED CONNECTOR

Steven Z. Muzslay, Huntington Beach, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,536

Int. Cl.[4] H01R *11/00*

U.S. Cl. 339—59 M **18 Claims**

1. A shell-less connector member comprising:

and insulative connector body comprising a front part and a rear part;

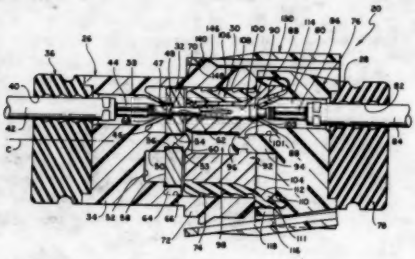
said rear part comprising a front section of relatively hard material and an integral rear section of elastomeric material;

at least one contact passage extending through said rear part;

a plurality of annular integral ribs on the wall of said passage in said rear section adapted to have a sealing fit with an insulated wire terminating in a contact in the forward portion of said passage in said front section;

integral contact retention fingers on said front section extending forwardly and inwardly from the wall of said passage for engaging a rearwardly facing shoulder on the contact to removably retain the contact in said passage;

means fixedly mounting said front part on said front section of said rear part, said front part being formed of a relatively hard material;



a bore extending through said front part concentric with said passage and adapted to receive the contact therein; and

said from part having a rearwardly facing shoulder surrounding said bore for restricting forward movement of the contact in said passage;

said front part embodying an integral elastomeric sealing section having a first set of annular, outwardly extending sealing ribs thereon adapted to sealingly engage the inner cylindrical wall of a recess in a mating connector member when said sealing section is pushed into the recess;

said sealing section of said front part embodying a second set of annular, outwardly extending sealing ribs thereon behind said first set;

said front section of said rear part embodying a cylindrical inner surface surrounding said second set of sealing ribs; and

said second set of sealing ribs are in sealing engagement with said inner surface.

4,639,062

CIRCUIT BOARD CONNECTION

Koki Taniguchi, Osaka; Shigeri Yamaguchi, and Keiji Nakayama, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 572,053, Jan. 19, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 839,807

Claims priority, application Japan, Jan. 25, 1983, 58-11039

Int. Cl.[4] H01R *11/00*

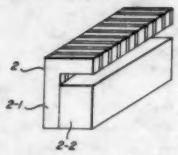
U.S. Cl. 339—59 M **3 Claims**

1. An integrated display board connection assembly for a printed wiring board consisting essentially of:

display segments having both common and segment sides to be independently connected to a wiring circuit of said printed wiring board;

a rubber connector consisting of a part that alternately contains conductive and insulated layers and a part that is only an insulator combined together so as to form an elongated slot for the insertion therein of said display segments such that selective contact is made by said respective common and segment sides of said display segments with said wiring circuit of said printed wiring board; and

an angle member interlocked with said printed wiring board, embracing and pressing said connector so as to bring a conductive film of said common side or said segment side



respectively, of said display segment into contact with a corresponding conductor of said printed wiring board via a conductor layer of said rubber connector.

4,639,063

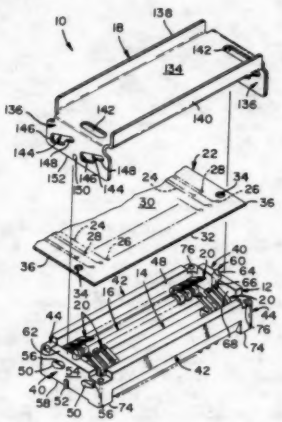
ELECTRICAL CONNECTOR FOR FLEXIBLE FILM CIRCUITS

Arthur L. Mueller, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1985, Ser. No. 811,580

Int. Cl.[4] H01R *9/09*

U.S. Cl. 339—75 M **19 Claims**



1. An electrical connector for electrically interconnecting conductors on a flexible film strip to circuit traces on a circuit board, comprising

dielectric housing means having side walls and end walls and a floor defining an upwardly opened cavity and having elongated passage means extending through said floor;

first cam means provided on said side walls of said housing means;

elongated means disposed in said passage means including a plurality of conductive contact element means spaced along and supported in an insulative member means, said contact element means having contact means extending upwardly in said cavity and lower portion means depending from said housing means for electrical connection to said circuit traces on said circuit board; and

cover means having base means and depending plate means at each side of said base means with second cam means thereon, said cover means being movably positioned on said housing means with said base means extending across the top of said housing means with a space therebetween to receive said flexible film strip, and said plate means extending along said side walls with said second cam means thereon cooperating with said first cam means on said side walls so that as said cover means is moved to a

closed position, said first and second cam means cooperate to move said cover means towards said housing means so that said flexible film strip inserted between said cover means and said housing means is engaged by said base means and pressed against said contact means to establish electrical contact between the conductors on said film strip and said contact means.

4,639,064

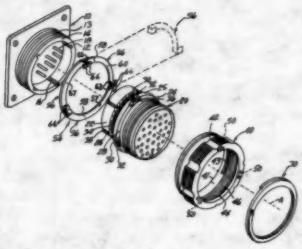
ANTI-DECOUPLING RESISTING AND EMI SHIELDING MEANS FOR AN ELECTRICAL CONNECTOR ASSEMBLY

Anthony W. Knapp, Laurens, and Dee A. Werth, Afton, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 28, 1986, Ser. No. 834,690

Int. Cl.[4] H01R *13/623*

U.S. Cl. 339—89 M **6 Claims**



1. An electrical connector assembly comprising a pair of cylindrical shells the forward end portions of which interfit for mating, a rotatable coupling nut for coupling the shells together, and means operative only near full mate for resisting rotation of said coupling nut, one shell including a forwardly and a rearwardly facing annular face and the other shell terminating in a foward end face which during coupling rotation is advanced towards the forwardly facing annular face, said coupling nut having an annular endwall adjacent to the rearwardly facing annular face, said means being characterized in that

an annular spring member is slidably disposed about said one shell,

said endwall includes a plurality of angularly spaced detents, and

said rearwardly facing annular face includes a cavity,

said spring member comprising a flat annulus adapted to be sandwiched between the forward end face and the forwardly facing annular face and including an axially extending flange portion which is initially adapted to seat within the cavity so as not to impede rotation and at full mate as a result of the forward end face driving the flat annular against the forwardly facing annular face is driven axially rearward to be deformed within one of the detents whereby to resist rotation.

4,639,065

WINDSHIELD WIPER MOTOR

Alfred Kohler, Bietigheim; Theodor Schneider, Freudental, and Karl F. Schubert, Bietigheim, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,603

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409680

Int. Cl.[4] H01R *13/514*

U.S. Cl. 339—119 R **19 Claims**

1. An electric wiper motor for motor vehicles, comprising:

a gear housing;

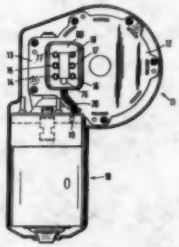
a cap covering said gear housing;

a plurality of plug contacts projecting from the outside of said cap for the connection of a mating plug;

a plurality of switch springs fixed to selected ones of said plug contacts, within said gear housing said selected ones of said plug contacts being fixed to said cap;

at least one of said plug contacts coupled to a motor supply lead;

and wherein



all of said plurality of plug contacts are formed as round pins and/or receptacles, said pins and/or receptacles project at least substantially perpendicularly from said cap, and the pin and/or the receptacle for said motor supply lead is guided at a structural member which is detachably secured to the outside of said cap.

4,639,066

CONNECTOR APPARATUS FOR A PRINTED CIRCUIT BASE BOARD

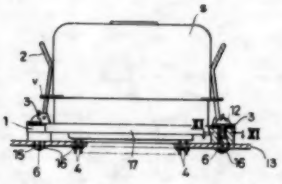
Yukio Shimamiya, Machida; Kinzo Narumo, Ichikawa, and Hiroshi Ebihara, Tokyo, all of Japan, assignors to Honda Tsushin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 713,990

Claims priority, application Japan, Jan. 23, 1985, 60-6731[U]

Int. Cl.[4] H01R *9/09*

U.S. Cl. 339—132 B **7 Claims**



1. A connector apparatus comprising:

a connector member including an insulation material connector body;

a large number of contacts projecting downwardly from said connector member body for positioning on a printed circuit base board;

an attaching member for attaching said connector member to said printed circuit base board;

an end portion of each of the contacts is connected by soldering to a printed circuit of the base board;

said attaching member comprises a metallic plate member with first and second opposite end portions and provided at the metallic plate member first end portion with a pair of legs including projections positioned at forward ends respectively for engagement with and for soldering to the printed circuit base board;

said attaching member including a tap screw which is screwed into a second end portion of the metallic plate member to clamp the connector member to the printed circuit base board;

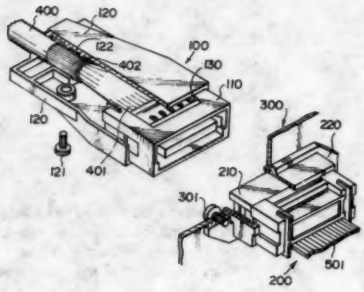
said second end portion of the metallic plate member is formed into a curved portion of an arc shape in section and the tap screw is screwed into the curved portion.

4,639,067

SHIELD STRUCTURE FOR ELECTRIC CONNECTORS

Sigeru Kikuta, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1985, Ser. No. 776,878
Claims priority, application Japan, Oct. 16, 1984, 59-216850
Int. Cl.[4] H01R 4/66
U.S. Cl. 339—143 R 3 Claims



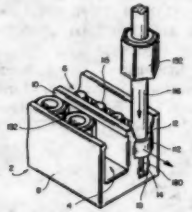
1. In a pair of electric connectors each of which comprises an insulating housing with a contact disposed therein and a conductive shield case surrounding the insulating housing, and which are coupled to each other, a shield structure characterized in that the insulating housing of one of said electric connectors has a portion protruding beyond the forward end of the conductive shield case of said one electric connector and adapted to be fitted into the conductive shield case of the other of said electric connectors, the conductive shield case of said one electric connector is provided on the inner wall of the rear end thereof with a cable clamp portion for coming into contact with the cable shield of a cable to be connected thereto, the forward end surface of the conductive shield case of said one electric connector is adapted to abut on the forward end surface of the conductive shield case of said other electric connector when said one electric connector is coupled to said other electric connector, earth plates are disposed on either outer side walls of the insulating housing of said one electric connector, a part of each of said earth plates being sandwiched between the inner wall of the conductive shield case of said one electric connector and the outer side wall of the insulating housing of said one electric connector so as to make contact with the inner wall of the forward end of the conductive shield case of said one electric connector and another part of each of said earth plates being laid on the outer side wall of the insulating housing of said one electric connector so as to be exposed outside the conductive shield case of said one electric connector, and said exposed part of each earth plate is adapted to come into the forward end of the conductive shield case of said other electric connector so as to make contact with the inner wall of the forward end of the conductive shield case of said other electric connector when said one electric connector is coupled to said other electric connector, whereby each of said earth plates extends across the abutting line of the forward end surface of the conductive shield case of said one electric connector past the forward end surface of the conductive shield case of said other electric connector so as to electrically connect the conductive shield case of said one electric connector to the conductive shield case of said other electric connector so that the cable shield of said cable can be positively and electrically connected to the conductive shield case of said other electric connector through said cable clamp portion, the body of the conductive shield case of said one electric connector and each of said earth plates.

4,639,068

HOLDER FOR COUPLING ASSEMBLY

Corey J. McMills, Los Altos, and James C. Milroy, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 14, 1984, Ser. No. 650,930
Int. Cl.[4] H01R 17/18
U.S. Cl. 339—177 R 1 Claim



1. A kit of parts for connecting a coaxial cable, comprising:
a connector body having a mating area for engaging an outer layer of a cable and means for focussing the deformation of a deformable compressive member;
a driver member for interconnection with the connector body for compressing the compressive member between the driver member and the connector body;
a deformable compressive member adapted for positioning around the cable at the mating area and having sufficient compressive strength to deform the outer layer of a coaxial cable against the mating area of the connector body; and
a holder for holding the connector body and the driver member, said holder having first and second longitudinal channels formed therein capable of holding a plurality of the driver members and connector bodies, respectively, in such a manner so as to allow the driver members and connector bodies to be longitudinally slid into and out of said respective channels and retained therein, said second longitudinal channel having first and second sets of ridges for retaining edges of upper and lower surfaces of the connector bodies, said second longitudinal channel further having a longitudinal recess extending from a lower one of the set of ridges therein for accommodating a stripped end of a coaxial cable when inserted through the connector body retained within the second channel so as to allow visual inspection of an insertion depth of the stripped end of the coaxial cable through the connector body.

4,639,069

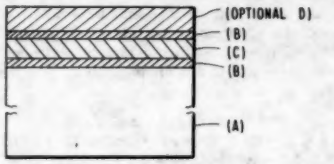
OPTICAL LAMINAR STRUCTURE

Toshiaki Yatabe, Tokyo; Toshio Nishihara, Yamaguchi, and Nobuo Suzuki, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jun. 28, 1983, Ser. No. 508,707
Claims priority, application Japan, Jun. 30, 1982, 57-115331; Dec. 15, 1982, 57-218438; Dec. 17, 1982, 57-220279; Dec. 17, 1982, 57-220280
Int. Cl.[4] G02B 5/24, 5/28; B05B 5/00; B05D 5/06
U.S. Cl. 350—1.7 5 Claims

1. An optical laminar structure being transparent for visible light and reflective for near infrared light comprising a dielectric layer arranged sandwichlike between thin metal layers, located on a transparent substrate, characterized in that the dielectric layer comprises a 30 nm to 200 nm (300 Å to 2,000 Å) thick transparent organic polymer layer with a refractive index

in the range of 1.35 to 1.65, the thin metal layer has a thickness of about 4 nm to about 15 nm (about 40 Å to about 150 Å) and



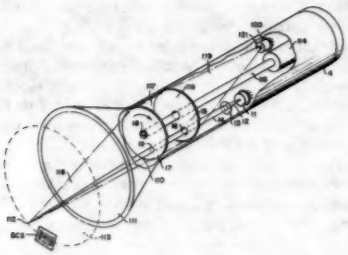
the transparent substrate is a 0.5 mm to 10 mm thick inorganic glass sheet or a 5 μm to 200 μm thick organic polymer film.

4,639,070

BEAM SCANNING TYPE INFORMATION READOUT DEVICE

Hiroyuki Ikeda, Yokohama; Seikichi Matsumoto, Sano; Shunji Kitagawa, Kawasaki; Takefumi Inagaki, Kawasaki, and Ichiro Sebata, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 9, 1981, Ser. No. 223,764
Int. Cl.⁴ G02B *26/12*
U.S. Cl. 350—3.71 **3 Claims**



1. A hand held information readout device for reading a bar-code symbol on an object, comprising:

a laser beam generator;

an optical scanner comprising a disk hologram which deflects and substantially scans the beam generated from said laser beam generator in at least two different directions for the bar-code symbol to be read and which receives and guides a scattered beam reflected from the bar code symbol;

a convergent lens for converging the guided scattered beam;

an optical detector which detects the beam reflected from the bar-code symbol, guided by said disk hologram and converged by said convergent lens; and

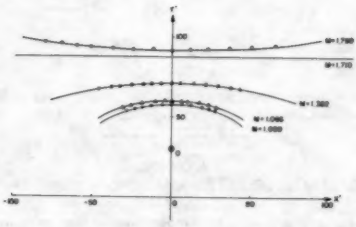
a case accommodating said laser beam generator, said optical scanner and said optical detector having a grip portion for holding the device by the operator and including a rotation drive source located at one end of said case for rotating said disk hologram, located at the other end of said case, about a rotation axis; said laser beam generator being positioned adjacent the rotation axis to project the beam substantially parallel to the rotation axis and said detector being substantially aligned with and positioned adjacent to the rotation axis to detect the converged guided reflected beam.

4,639,071

LIGHT SCANNING APPARATUS

Seikichi Matsumoto, Sano, and Hiroyuki Ikeda, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 271,046, Jun. 5, 1981, abandoned. This application Feb. 26, 1986, Ser. No. 833,579
Claims priority, application Japan, Jun. 6, 1980, 55-76137
Int. Cl.⁴ G02B *26/10*
U.S. Cl. 350—3.71 **11 Claims**



1. A method for controlling the shape of a scanning locus of a light beam of a reconstruction wavelength on a surface of an object to be scanned, comprising the steps of

providing a reconstruction beam with said reconstruction wavelength, and

moving said reconstruction beam across a hologram mounted on a disc by means of rotating said disc about a rotation axis,

wherein said hologram has interferences fringes produced by interferring an object wave and a reference wave of a construction wavelength that is different from said reconstruction wavelength, said reference wave having a focus at a distance F from said hologram being produced, said interference fringes of said hologram define an optical axis of said hologram, said optical axis and said axis of rotation are arranged in parallel and spaced a distance R apart, and the value of said reconstruction wavelength, and said distances F and R, are determined to provide a selected shape of said scanning locus of said reconstruction beam on said surface to be scanned, as diffracted by said hologram on said rotating disc.

4,639,072

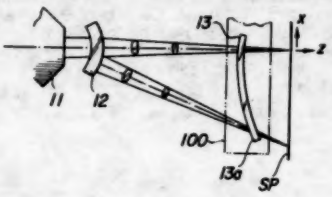
OPTICAL BEAM SCANNING APPARATUS INCLUDING A CYLINDRICAL LENS HAVING ITS OPPOSITE ENDS CLOSER TO THE SCANNED PLANE THAN ITS MEDIAL PORTION

Toyotsugu Itoh, Hachioji, and Toshio Muramatsu, Musashino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 476,811, Mar. 18, 1983, Pat. No. 4,496,209. This application Nov. 29, 1984, Ser. No. 676,591
Claims priority, application Japan, Mar. 21, 1982, 57-45059
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.⁴ G02B *26/10*
U.S. Cl. 350—6.8 **13 Claims**

1. In an optical beam scanning apparatus wherein a light beam from a light source is reflected by a rotary polygonal mirror and then radiated to a scanned plane through a condens-

ing lens for scanning of the beam, the improvement in that a cylindrical lens bent to have both ends in the longitudinal



direction thereof approaching to said scanned plane is disposed between said condensing lens and said scanned plane.

4,639,073

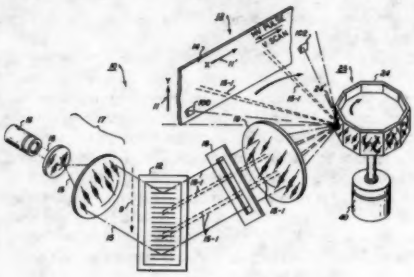
ELECTRO-OPTIC PULSE IMAGING RASTER OUTPUT SCANNER

Kwok-leung Yip; Mehdi N. Araghi, both of Webster; Joseph J. Daniele, Pittsford; Martin E. Banton, Fairport; Charles J. Kramer, Pittsford, and Joachim A. Ritter, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1984, Ser. No. 590,922

Int. Cl.[4] G02B *26/10*; H04N *1/04*

U.S. Cl. 350—6.8 **8 Claims**



1. A high performance pulse imaging system, comprising in combination:

(a) means providing a beam of high intensity radiation;

(b) a recording member on which images are formed,

(c) modulator means for modulating said beam in response to an image signal input to provide an imaging beam;

(d) a movable scanning element for line scanning said imaging beam across said recording member to expose said recording member and form images thereon;

said modulator means including:

(1) a substrate, and

(2) a row of discrete electrodes in operative relation with said substrate, said beam impinging on said row of electrodes, selective application of preset potentials to individual ones of said electrodes changing the index of refraction of said substrate in the vicinity of said electrodes and causing each segment of said beam passing through said substrate where the index of refraction is changed to be diffracted into at least one other path, each diffracted segment cooperating with any other diffracted segments to form a diffracted beam, remaining non-diffracted segments of said beam cooperating to form a non-diffracted beam;

(3) one of said diffracted or non-diffracted beams comprising said imaging beam; and

(e) control means for stepping said potentials across said row of electrodes from one end to the other so that said modulator outputs a succession of the segments of said beam progressing along said row of electrodes for each imaging spot, the segments of said beam progressing in a direction opposite to the direction of movement of said scanning element whereby to balance the rate at which successive ones of the segments of said beam are impinged on said recording member with the rate of movement of said scanning element to obviate image blur.

4,639,074

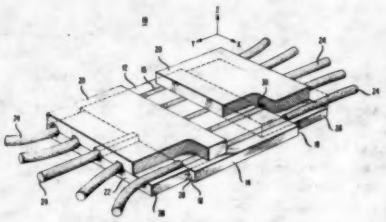
FIBER-WAVEGUIDE SELF ALIGNMENT COUPLER

Edmond J. Murphy, Bethlehem, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 18, 1984, Ser. No. 621,453

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.15 **7 Claims**



1. An optical fiber to waveguide coupler comprising

a first substrate containing at least one optical waveguide longitudinally disposed along a top surface thereof, at least one endface of said first substrate perpendicular to said top surface;

a second substrate including at least one longitudinal groove, each groove capable of containing an optimal fiber; and

a cover plate disposed to partially cover said second substrate and said at least one optical fiber located therein, an endface of said cover plate lying in the same plane as an endface of said at least one optical fiber, said cover plate endface connected to said first substrate endface such that said second substrate overlaps a portion of said top surface of said first substrate and said at least one optical fiber is aligned with said at least one optical waveguide.

4,639,075

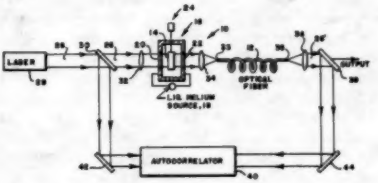
DISTORTION FREE FIBER OPTIC SYSTEM

Michael M. Salour, Cambridge, Mass., and Gustav W. Fehrenbach, Essen, Fed. Rep. of Germany, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 23, 1983, Ser. No. 497,443

Int. Cl.[4] G02B *6/28*; G02F *1/00*

U.S. Cl. 350—96.16 **18 Claims**



1. A distortion free optical fiber system comprising:

means for providing a beam of electromagnetic radiation, said beam of electromagnetic radiation being at a preselected wavelength;

an optical fiber optically aligned with said beam of electromagnetic radiation for passing said beam of electromagnetic radiation therethrough, said optical fiber having a first end and a second end;

compensator means positioned adjacent one of said ends of said optical fiber for receiving and passing therethrough said beam of electromagnetic radiation and for compensating for any distortion which may be incurred by said electromagnetic beam of radiation as said beam passes through said optical fiber, said compensator means including a semiconductor material having a predetermined excitonic-polariton resonance and a corresponding anomolous dispersion region; and

said preselected wavelength of said beam of electromagnetic radiation being tuned to said predetermined excitonic-polariton resonance and to said anomolous dispersion region of said semiconductor material such that dispersion through said semiconductor material counterbalances dispersion through said optical fiber, and wherein distortion free propagation within said fiber takes place when the following criteria is established:

$$\frac{d^i}{d\lambda^i} n = 0,$$

where $i \geqq 2$ and i=an integer, λ=said preselected wavelength of said beam of electromagnetic radiation and n=index of refraction of said semiconductor material;

whereby said beam of electromagnetic radiation is output from said system substantially distortion free.

15. A method of providing substantially distortion free transmission of a beam of electromagnetic radiation through an optical fiber, comprising the following steps:

(a) providing compensator means in the form of a semiconductor material having a predetermined excitonic-polariton resonance and a corresponding anamolous dispersion region matched to a preselected wavelength of said beam of electromagnetic radiation such that dispersion through said semiconductor material counterbalances dispersion through said optical fiber and the following criteria is established:

$$\frac{d^i}{d\lambda^i} n = 0$$

where $i \geqq 2$ and i equals an integer, λ=said wavelength of said beam of electromagnetic radiation, and n=the index of refraction of said semiconductor material;

(b) positioning said semiconductor material in optical alignment with and adjacent either end of said optical fiber; and

(c) passing said beam of electromagnetic radiation having said preselected wavelength through both said semiconductor material and said optical fiber.

4,639,076

LENS HOLDER ASSEMBLY FOR A FIBER OPTIC CONNECTOR

John H. Mikolaicyk, Oneonta, and Leonard A. Krantz, Jr., Sidney, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 14, 1983, Ser. No. 550,848

Int. Cl.⁴ G02B 6/36

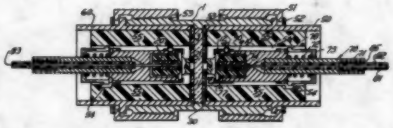
U.S. Cl. 350—96.20 **10 Claims**

5. In combination with a fiber optic connector of the type having: a housing having a central passage; an insert mounted in the central passage of said housing, said inset having at least one bore therein; at least one lens; and means for mounting a lens in each bore, the improvement wherein the lens and lens mounting means comprises:

a lens holder assembly for terminating an optical fiber, and a respective one of said lens holder assembly located in each of said bores, said lens holder assembly comprising:

a tubular member having a forward end, a rear end, and a central passage extending between the ends for receiving an optical fiber;

a lens removably mounted on the forward end of said housing; and said lens having a forwardly facing curved surface and a recess in the surface opposite said curved surface, said recess axially aligned with the curved surface for receiving an end of an optical fiber therein and located at the focal point of said lens for terminating said optical fiber;



means for mounting said lens to said tubular member so that said curved surface is facing forwardly and said recess is facing rearwardly and is axially aligned with the central passage in said tubular member and adapted to receive said one end of said optical fiber; and

means for releasably retaining a lens holder assembly in each bore of said insert, said means including a plurality of resiliently and radially deflectable spring fingers extending axially in each bore and located on one of said insert and lens holder assembly and a surface located on the other of said insert and lens holder assembly that engages the ends of each of said fingers to selectively prevent axial movement of said lens holder assembly in one axial direction.

4,639,077

COUPLING FOR A LIGHT-CONDUCTING FIBER

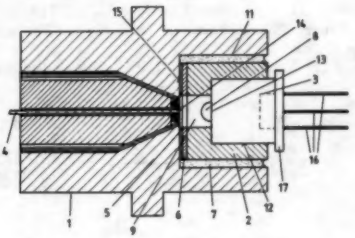
Thomas Dobler, Windisch, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 19, 1984, Ser. No. 632,429

Claims priority, application Switzerland, Jul. 21, 1983, 3993/83

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.20 **12 Claims**



1. A coupling for a light-conducting fiber having an end piece, comprising:

a metal coupling body;

a first device mounted in the coupling body and adapted for holding the end piece of said light-conducting fiber;

an opto-electronic transmitting element mounted in a housing having an exit opening for light to be emitted by said element;

a metal cap for holding the opto-electronic transmitting element such that the exit opening is adapted to be opposite to an end face of the light-conducting fiber, said opto-electronic transmitting element fitted into said metal cap

and having a through-hole for providing an optical connection between said exit opening and said fiber end face;

said opto-electronic transmitting element thermally coupled via said metal cap to the coupling body in order to improve heat dissipation; and

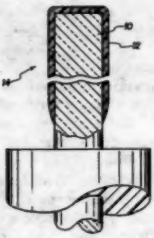
said housing and said coupling body defining therebetween a thermal resistance less than 100° C./W.

4,639,078

OPTICAL FIBER ATTENUATOR AND METHOD OF FABRICATION

Sang K. Sheem, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 5, 1984, Ser. No. 658,330
Int. Cl.⁴ G02B 6/38
U.S. Cl. 350—96.21 **2 Claims**



1. The method of making an optical fiber attenuator comprising the steps of:

coating a portion of a first optical fiber, including an end thereof, with a liquid which includes an adhesive and submicron light absorbing particles;

ultrasonically spreading said liquid about the surface of said fiber portion so as to achieve a substantially uniform coat of said liquid on said portion;

curing said coat;

testing the attenuation provided by said coat; and

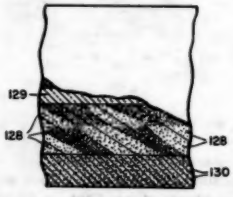
splicing said first fiber at said end to an end of a second optical fiber.

4,639,079

OPTICAL FIBER PREFORM AND METHOD

Dale R. Powers, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 427,523, Sep. 29, 1982. This application Oct. 28, 1985, Ser. No. 776,523
Int. Cl.⁴ G02B 6/22
U.S. Cl. 350—96.33 **8 Claims**



1. A rotationally symmetrical optical waveguide preform comprising a cylindrically-shaped region formed of a plurality of adjacent layers, each layer formed of first and second sublayers of glass particles, said first sublayer having a refractive index greater than that of said second sublayer, each sublayer comprising first and second sections, said first section of said first sublayer being adjacent to one of the adjacent layers and said second section of said first sublayer being adjacent to the adjacent layer that is opposite said one of the adjacent layers.

4,639,080

OPTICAL FIBERS COATED WITH MODIFIED 1,4-POLYBUTADIENES

Takao Kimura; Nobuo Inagaki, both of Ibaragi; Mitsuo Yoshihara, and Fumihiko Kato, both of Osaka, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nitto Electric Industrial Co., Ltd., both of, Japan

Division of Ser. No. 394,245, Jul. 1, 1982, abandoned. This application Aug. 28, 1984, Ser. No. 645,138
Claims priority, application Japan, Jul. 4, 1981, 56-104770
Int. Cl.⁴ G02B 6/00
U.S. Cl. 350—96.34 **2 Claims**

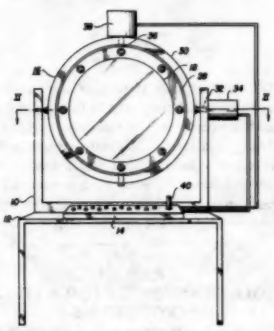
1. An optical glass fiber coated with a cured product formed from a coating material comprising 1,4-polybutadienes having functional groups or modified polybutadienes derived from the 1,4-polybutadienes and having introduced therein polymerizable double bonds different from the double bonds present in the 1,4-polybutadienes, further including a compound having polymerizable double bonds, and wherein the modified polybutadienes are polycondensation products of the 1,4-polybutadienes having functional groups and polyfunctional compounds having polymerizable double bonds.

4,639,081

GIMBALLED THREE-DIMENSIONAL DISPLAY SYSTEM

Thomas P. O'Brien, Deerfield, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 15, 1985, Ser. No. 766,018
Int. Cl.⁴ G02B 7/18, 27/22, 17/00, 5/10
U.S. Cl. 350—144 **7 Claims**



1. A three-dimensional display system comprising:

(a) a volumetric display mechanism including a flexible membrane mirror;

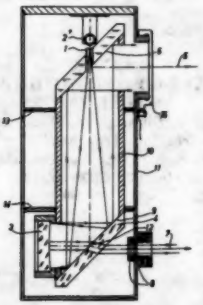
(b) a console having user operator controls mounted thereon which govern image projection onto said mirror; and

(c) means for permitting a user of said console to maintain contact with said controls while changing the angular view of said image comprising a two axis remote control gimbal support for said mirror with said remote control for said gimbal support included with said user operator controls.

4,639,082
COLLIMATOR FOR COORDINATING TWO OPTICAL DEVICES

Fernand R. Loy, Sceaux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,890
Claims priority, application France, Apr. 17, 1984, 84 06057
Int. Cl.[4] G02B *27/14, 5/08*
U.S. Cl. 350—172 7 Claims



1. A collimater for coordinating two optical devices which operate in different wavelength regions, said collimator comprising:

a radiation source emitting radiation in two wavelength regions;

a plane mirror with an opening therein, said opening being arranged in front of the radiation source so as to define a primary beam having an optical axis, the plane mirror being arranged at an acute angle x with respect to the primary beam optical axis;

a plate arranged on the optical axis in front of the plane mirror, said plate having two substantially parallel surfaces, said plate being arranged at an acute angle y with respect to the primary beam optical axis;

a reflective layer on one parallel surface of the plate, said reflective layer having an opening therein;

a concave mirror arranged in front of the plate on a secondary beam optical axis, said secondary beam optical axis coinciding with the reflection of the primary beam axis by the plate, said concave mirror having a focus on the primary beam optical axis at the opening in the plane mirror; and

a compensator arranged behind the plate to receive radiation from the concave mirror which passes through the opening in the reflective layer.

4,639,083
LENS MOUNTING

Yutaka Fuziwara, and Hiroshi Yamamoto, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,745
Claims priority, application Japan, Aug. 18, 1983, 58-150827
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—255 3 Claims

1. A lens mounting comprising:

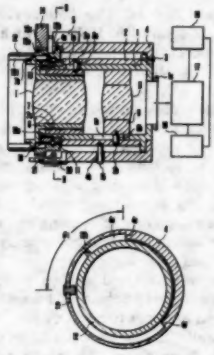
(a) a focusing lens and a lens holder;

(b) a distance adjusting ring for moving said focusing lens, said distance adjusting ring including a radial projection for stopping rotation of said distance adjusting ring;

(c) a body tube including first and second stop portions for engagement with said radial projection of said distance adjusting ring; and

(d) stop means for shortening the range of movement of said distance adjusting ring,

said stop means including a stopper axially movable between a position for engagement with said radial pro-



jection of said distance adjusting ring and another position for disengagement therefrom.

4,639,084
LENS BARREL IN WHICH MOTOR CAPABLE OF SELECTING STEPPING DRIVE OR BRUSHLESS DRIVE IS PROVIDED

Michihiro Kugioka, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,150
Claims priority, application Japan, Jan. 10, 1984, 59-2428; Jan. 19, 1984, 59-8340
Int. Cl.[4] G02B *7/04;* H02K *21/08*
U.S. Cl. 350—255 3 Claims

1. A lens barrel incorporating a motor, comprising:

a hollow cylindrical permanent magnet positioned in said lens barrel and provided with a step driving permanent magnet portion and a brushless driving permanent magnet portion;

step driving coils; and

brushless driving coils;

wherein a lens system is axially moved by the rotary motion of said hollow cylindrical permanent magnet; and

wherein, in case the amount of movement required for bringing said lens system to the in-focus position exceeds a predetermined value, said lens system is moved to a position corresponding to said predetermined value by the rotary motion of said brushless driving permanent magnet portion, and, in case said amount is equal to or less than said predetermined value, said lens system is moved to said in-focus position by the stepping rotary motion of said step driving permanent magnet portion.

4,639,085
VISOR WITH MIRROR WITH FLEXIBLE SLIDING COVER

Konrad H. Marcus, and Zooey C. Chu, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

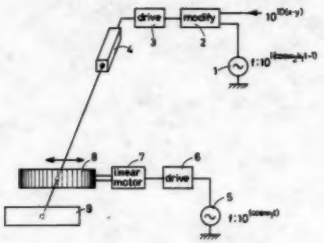
Filed Nov. 21, 1983, Ser. No. 553,645
Int. Cl.[4] G02B 17/00; B60J 3/00
U.S. Cl. 350—283 8 Claims

1. In a visor having a covered mirror comprising:
a visor body defining a housing having a frame;
a mirror stationarily mounted to said visor body in said frame, said frame including an opening in which said mirror is mounted, said opening exposing said mirror;
said housing including an aperture extending adjacent and along at least one edge of said opening and mirror;
a flexible cover for said mirror, said cover being of a size and shape to cover said opening;
roller means mounted within said housing, adjacent opposite edges of said opening and behind said frame; and
rigid means secured to opposite edges of said flexible cover substantially parallel to said opposite edges of said opening; said rigid means being coupled to each other by strings to form a continuous loop extending around said roller means for permitting movement of said cover around said roller means and through said aperture between a first position covering said opening and covering said mirror and between a second position extending into said housing behind said mirror so as to expose said mirror through said opening.

4,639,086
METHOD OF RECORDING A HALFTONE IMAGE

Ikuo Mitsuka, Shiga, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 510,871, Jul. 5, 1983, abandoned. This application Jan. 9, 1986, Ser. No. 816,994
Claims priority, application Japan, Oct. 4, 1982, 57-175120
Int. Cl.[4] G03F 5/00
U.S. Cl. 350—322 2 Claims



1. A system for exposing an image of continuously varying intensity composed of halftone dots to a photosensitive material, comprising:
means for obtaining original picture image signals;
oscillator means for generating a carrier wave described by the formula:

$$10^{\cos \omega_2(x \sin \alpha + y \cos \alpha)-1};$$

where:
ω_2 represents a fundamental frequency of transmissivity distribution in a main scanning direction,
α represents a contact screen angle, and
x, y are contact screen coordinates;
means for multiplying said carrier wave by said image signals to obtain a modulation signal;
a light source for generating a thin exposure beam;
means responsive to said modulation signal for controlling said light source to intensity modulate said exposure beam;
a filter having a predetermined density distribution; and
means for oscillating said density filter;
said exposing beam being directed through said oscillating density filter to further intensity modulate said beam in accordance with the formula:

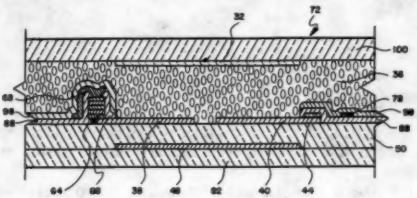
$$10^{\cos \omega_1(x \cos \alpha - y \sin \alpha)-1}$$

where ω_1 represents a fundamental frequency of transmissivity distribution in a subscanning direction, and α is the contact screen angle.

4,639,087
DISPLAYS HAVING PIXELS WITH TWO PORTIONS AND CAPACITORS

Vincent D. Cannella, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 8, 1984, Ser. No. 639,001
Int. Cl.[4] G02F 1/133
U.S. Cl. 350—332 28 Claims



1. In a display, including a matrix of pixels, at least one of said pixels having a pixel capacitance and an auxiliary capacitance and comprising:
a first electrode including at least two spaced apart electrode portions;
a second electrode spaced from and facing said first electrode portions in substantially parallel relation thereto said second electrode also being electrically insulated from all external circuit connections and from all other pixel electrodes;
light influencing display material between said first electrode and said second electrode;
a third electrode spaced from and facing said first electrode on the side of said first electrode opposite said light influencing material, said third electrode also being electrically insulated from all external circuit connections and from all other pixels, said second electrode forming with said first electrode said pixel capacitance and said third electrode forming with said first electrode said auxiliary capacitance electrically in parallel with said pixel capacitance.

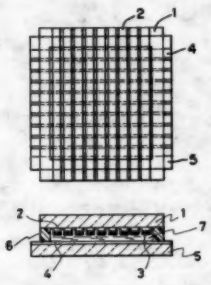
4,639,088
MULTI-COLOR DISPLAY DEVICE AND PROCESS OF FABRICATING SAME

Mitsuru Suginoya; Koji Iwasa; Hitoshi Kamamori; Yutaka Sano, and Yumiko Terada, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jul. 19, 1984, Ser. No. 632,488
Claims priority, application Japan, Jul. 19, 1983, 58-131501
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—339 F 16 Claims

1. A process of fabricating a multi-color display device comprising the steps of: forming a plurality of display electrodes on a first substrate, selectively forming a color filter on each display electrode by electrodepositing a polymer together with coloring matter and electroconductive particles so that the display electrodes have different colors and electroconductivity, forming a counter electrode on a surface of a second substrate, and sandwiching a display material between said first

substrate and said second substrate, said display material serving, in operation, as a light shutter controlled by the voltage applied between said color filter via said display electrodes and the counter electrode.

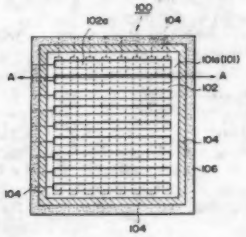


4,639,089

LIQUID CRYSTAL DEVICE

Shinjiro Okada, Kawasaki; Kazuharu Katagiri, and Junichiro Kanbe, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1985, Ser. No. 690,896
Claims priority, application Japan, Jan. 23, 1984, 59-10502
Int. Cl.⁴ G02F *1/13, 1/135*
U.S. Cl. 350—341 **33 Claims**



1. A liquid crystal device comprising a pair of base plates and a liquid crystal interposed between the pair of base plates; said liquid crystal showing a smectic phase and a cholesteric phase at a higher temperature than that giving the smectic phase and being capable of causing successive phase transition from the cholesteric phase through a smectic A phase to a chiral smectic phase having a non-spiral structure on temperature decrease; a face of at least one of said pair of base plates having been provided with a function of preferentially orienting the axes of the liquid crystal molecules contacting the face in one direction.

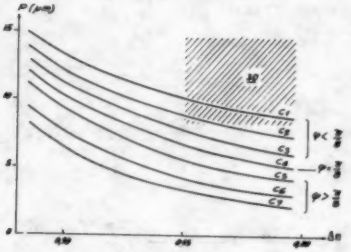
4,639,090

LIQUID CRYSTAL DICHROIC DISPLAY WITH A HIGH BRIGHTNESS CONTRAST

Jean-Frédéric Clerc, Meylan, and Francis Muller, Seyssinet, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 22, 1985, Ser. No. 736,816
Claims priority, application France, May 30, 1984, 84 08547
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—346 **6 Claims**

1. A liquid crystal dichroic display with a high brightness contrast, comprising a liquid crystal film between two walls separated by a shim, one wall carrying transparent electrodes and the other wall a counterelectrode, said liquid crystal film having an optical anisotropy Δn and, in the absence of an electric field, a twisted or helical structure of pitch p, the wall carrying the counterelectrode being at least partly covered with a reflecting coating reversing the polarization of a circularly polarized electromagnetic wave and the optical anisotropy Δn and the pitch p being such that the light wave absorbed least by the display used in transmission has an ellipticity at least equal to $\pi/8$.

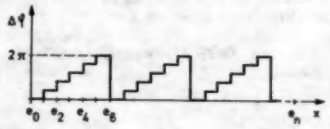


4,639,091

STATIC DEFLECTOR DEVICE FOR AN INFRARED BEAM

Jean-Pierre Huignard; Marcel Malard, and Guy de Corlieu, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 27, 1984, Ser. No. 583,645
Claims priority, application France, Feb. 25, 1983, 83 03132
Int. Cl.⁴ G02F *1/137*; G02B *5/18*
U.S. Cl. 350—347 V **15 Claims**



1. A static deflector device for deflecting a polarized infrared beam, said device being for use with a source of a polarized infrared beam, and comprising:

deflector means for deflecting said beam, said deflector means comprising a liquid crystal layer and modulator means for modulating said liquid crystal layer; and

control signal generator means for generating a control signal and applying said control signal to control said modulator means, thereby creating local variations of refractive index in said layer in such a manner as to form a beam diffraction grating of adjustable spacing in said liquid crystal layer;

said control signal being periodic in space having a staircase waveform varying from a minimum value to a maximum value in a continuous progression of N steps per period in such a manner that the maximum value causes an incident beam to be phase-shifted by 2π;

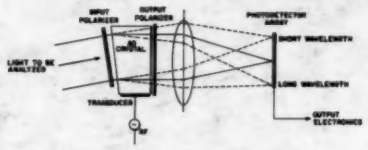
said modulator means for modulating said liquid crystal layer comprising electrodes disposed on both faces of said layer, the electrodes on the incident face of the layer being transparent, electrically isolated, and disposed in zones that are equidistant from one another and which are separated by inter-electrode spaces which, at least in one direction, range in size between 1 and 10 micrometers, a common electrode being disposed on the other face of said liquid crystal layer.

4,639,092

ACOUSTO-OPTIC DISPERSIVE LIGHT FILTER

Milton Gottlieb, Churchill Boro, Pa., and Fredrick L. Schaff, Ellicott City, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1984, Ser. No. 666,416
Int. Cl.[4] G02F 1/11, 1/33
U.S. Cl. 350—372 6 Claims



1. A method for instantaneously monitoring two or more wavelengths of light comprising the steps of:

directing the light to be analyzed through an optically birefringent crystal having an optical input face, an optical output face and a pair of opposed parallel sides, wherein said light to be monitored is incident in one polarization and at a predetermined fixed angle over its entire spectral range to said optical input face, which optical input face is normal to the incident light and wherein one of said opposed parallel sides has means acoustically coupled therewith for launching acoustic waves into said crystal;

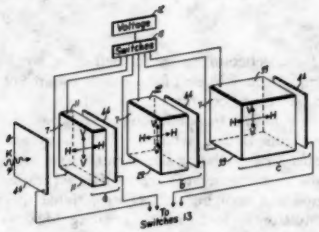
launching acoustic waves into said crystal at a predetermined fixed frequency wherein each wavelength resolution element which emerges from the crystal is at a different diffracted angle as a result of the interaction with the acoustic waves.

4,639,093

SWITCHABLE BANDWIDTH FILTER

Frederick Kubick, White Plains, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 2, 1984, Ser. No. 585,817
Int. Cl.[4] G02B 27/00; G02F 1/05, 1/21
U.S. Cl. 350—388 18 Claims



1. A filter device for switching between bandwidth states of a beam of millimeter wavelength radiation, comprising:

a plurality of stages of a material medium each having parallel input and output walls, and a pair of opposite sides, one of said pairs being horizontally and the other vertically disposed, each said medium being birefringent and having an optical axis and having at least two possible directions of orientation for said optic axis, and one of said directions being disposable parallel to the propagation of said beam of millimeter wavelength radiation;

at least two pairs of electrodes for each medium, each of said pairs straddlingly adjacent a corresponding one of said media, each of said pairs of electrodes being generally plane-parallel with respect to each other and each of said pairs of electrodes being orthogonal to a different one of said two directions of said optic axis; and

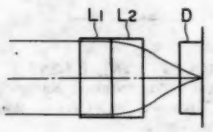
selective means for selectively providing electric power to selected ones of said pairs of electrodes and then to others of said pairs of electrodes, whereby an electric field is capable of establishment and disestablishment with respect to said material media and thereby effective for reorienting the optic axis of said material media from one direction to the other whereby the bandwidth of said millimeter wavelength radiation is discretely variable.

4,639,094

GRADIENT INDEX LENS SYSTEM

Yasuhiro Aono, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,371
Claims priority, application Japan, Oct. 4, 1982, 57-173277; Oct. 4, 1982, 57-173278
Int. Cl.[4] G02B 3/00
U.S. Cl. 350—413 23 Claims



1. A gradient index lens system for use as a pick-up lens for an optical disc, in which spherical aberration and coma are well corrected and which has an excellent imaging performance, said lens system comprising:

a first gradient index lens of a convergent refractive power having a gradient index rotationally symmetrical with respect to the optical axis thereof and having a refractive index which continuously decreases as the radius from the optical axis increases until the periphery is reached, and

a second gradient index lens of a convergent refractive power having a gradient index rotationally symmetrical with respect to the optical axis thereof and having a refractive index which continuously decreases as the radius from the optical axis increases until the periphery is reached,

the gradient index of said first gradient index lens being different from that of said second gradient index lens, and the gradient index of said first and second gradient index lenses being so determined that spherical aberration and coma of said lens system are compensated,

wherein when the gradient index n_1 of said first gradient index lens and the gradient index n_2 of said second gradient index lens are expressed by

$$n_1^2 = n_{01}^2 \{1 - (g_1 r)^2 + h_{41}(g_1 r)^4 + h_{61}(g_1 r)^6\}$$

$$n_2^2 = n_{01}^2 \{1 - (g_2 r)^2 + h_{42}(g_2 r)^4 + h_{62}(g_2 r)^6\},$$

the following conditions are satisfied:

$$1.0 < h_{41} < 5.0$$

$$-1.5 < h_{61} < 0$$

$$-5.0 < h_{42} < -0.5$$

$$1.0 < h_{62} < 8.0$$

where n_0 is the center refractive index, r is the radial distance from the optical axis, g is a parameter indicative of the degree of refractive index gradient, h_4 and h_6 are the coefficients of the fourth order term and the sixth order

term as the high order terms of gradient index, and subscript numbers 1 and 2 mean that the gradient indices are the amounts regarding said different first and second gradient index lenses.

4,639,095

TELEPHOTO ZOOM LENS

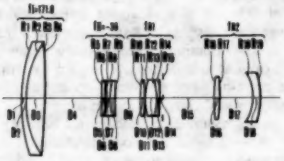
Masatake Kato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,053

Claims priority, application Japan, May 17, 1982, 57-82643

Int. Cl.⁴ G02B *15/163*

U.S. Cl. 350—427 **3 Claims**



1. A telephoto zoom lens comprising:

three lens groups, said three lens groups being, from front to rear,

a 1st lens group of positive refractive power, a 2nd lens group of negative refractive power, and a 3rd lens group of positive refractive power,

said 3rd lens group being always stationary during zooming, said third lens group having a front sub-group of positive power, and a rear sub-group of positive power,

said 1st lens group and said 2nd lens group being made movable in order to change the focal length of the entire system, whereby the ratio of the amounts of movement ($d\eta/d\xi$) at the focal length of the telephoto side satisfies the following condition:

$$0.4<(-d\eta/d\xi)<5.0$$

wherein the focal length of the wide angle side is taken as a start point, the positive sign is given when measuring from front to rear, and ξ and η denotes the amounts of movement of said 1st lens group and said 2nd lens group respectively and wherein said telephoto zoom lens satisfying the following conditions:

$$0.6<(Ra/fI)<0.9$$

$$-12.0<(Rb/fII)<7.0$$

$$0.7<(Rc/fII)<1.2$$

$$Rd<0$$

$$1.60<N2<1.85$$

$$0.04<Nb<0.16$$

where

Ra is the radius of curvature of the front lens surface of the 1st lens, counting from front, in said 1st lens group,

Rb is the radius of curvature of the front lens surface of the 1st lens, counting from front, in said 2nd lens group,

Rc is the radius of curvature of the cemented surface of the cemented lens in said 2nd lens group,

Rd is the radius of curvature of the rear lens surface of the last lens in said rear sub-group,

N2 is the arithmetic means of the refractive indices of the glasses of the negative lenses in said 2nd lens group, and

Nb is the difference between the refractive indices of the glasses of the two lenses of the cemented lens of said 2nd lens group.

4,639,096

HIGH RANGE ZOOM LENS

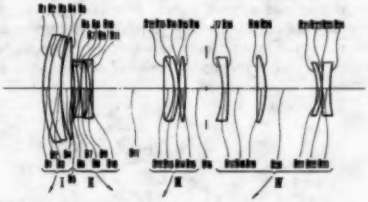
Nozomu Kitagishi, Tokyo; Kikuo Momiyama; Keiji Ikemori, both of Kanagawa; Sadatoshi Takahashi, Tokyo, and Tsunefumi Tanaka, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1984, Ser. No. 657,762

Claims priority, application Japan, Oct. 6, 1983, 58-187398

Int. Cl.⁴ G02B *15/14*

U.S. Cl. 350—427 **6 Claims**



1. A zoom lens comprising:

from front to rear, a first lens group having a positive refractive power;

a second lens group having a negative refractive power;

a third lens group having a positive refractive power; and

a fourth lens group, at least said first, said third and said fourth lens groups being movable for zooming, and said zoom lens satisfying the following conditions:

$$-3<\beta_{3w}<-0.8$$

$$-0.35<f3/f4<0.43$$

$$0.5<Z2/Z<1$$

$$!<f1/fw<1.7$$

$$0.3<|f2|/fw<0.48$$

wherein

fi is the focal length of the i-th lens group counting from the front;

Z2 is the range of variation with zooming of the magnification power of said second lens group;

β_{3w} is the magnification power of said third lens group in a wide angle position;

fw is the shortest focal length of the entire system; and

Z is the zoom ratio of the entire system.

4,639,097

APPARATUS FOR THE INSPECTION OF COMBINED READ/WRITE HEADS OF DATA CARRIER DISKS IN EDP INSTALLATIONS

Artur Teske, Klaus-Groth-Str. 2, Neu-Wulmstorf, and Dietrich A. Klimmeck, Krambekweg 27, D-2359 Henstedt-Ulzburg, both of Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,632

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 8304588[U]; Nov. 4, 1983, 83111007

Int. Cl.⁴ G02B *21/18, 21/24*

U.S. Cl. 350—507 **7 Claims**

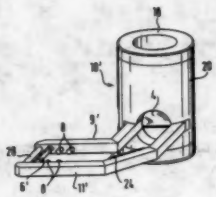
1. An apparatus for the inspection of combined read/write heads of data carrier disks in data processing installations, comprising:

a mirror holder, having a first side and a second side, said first side having a first area, a second area coupled to said first area and forming an angle of substantially 45 degrees therewith, and a third area, coupled to said second area and forming an angle of substantially 45 degrees therewith, and said second side having a first area, and a second area, coupled to said first area at a substantially right angle;

prism mirror means extending between said first area of said first and second sides of said mirror holder, respectively;

a second mirror, coupled to said second area of said first side; said prism mirror means having an upper mirror surface and a lower mirror surface extending at a selected angle to said upper surface, and a plane of symmetry which extends through a midpoint of said second mirror, for simultaneously reflecting light from both an upper surface and a lower surface of said object to be observed toward said second mirror;

a first optical path extending between said prism mirror means and said second mirror and an object to be observed being disposed in the vicinity of said prism mirror means, so that said prism mirror means reflects an optical sample of said object to be observed toward said second mirror;



a third mirror extending between said third area of said first side and said second area of said second side, light from said second mirror being coupled toward said third mirror;

first and second illuminating means, disposed on said first and second sides of said mirror holder, respectively near said prism mirror means, for illuminating said vicinity of said prism mirror means, to enable a better optical sample to be transmitted; and

lens means, disposed at an angle to said first optical path, light from said third mirror being coupled toward said lens means, and a focal length of said lens means being greater than a length of a second optical path which extends from said object to be observed in the vicinity of said prism mirror means to a principal plane of said lens means.

4,639,098

MICROSCOPE

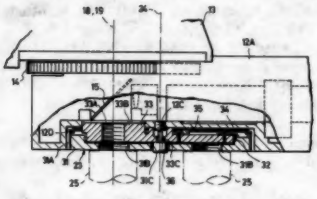
Tsutomu Aoyama; Taizo Nakamura; Naoyosi Terao, and Hirohiko Shinonaga, all of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,506

Claims priority, application Japan, Nov. 30, 1983, 58-185311[U]; Dec. 28, 1983, 58-203941[U]; Dec. 28, 1983, 58-203942[U]

Int. Cl.⁴ G02B *21/20, 7/16*

U.S. Cl. 350—514 **12 Claims**



1. A microscope, comprising:

a main body having vertically spaced upper and lower frames horizontally elongated in parallel to each other;

means defining a first optical axis on said upper frame;

a disk and rotational support means for rotatably supporting said disk on an undersurface of said upper frame about an axis of rotation extending parallel to said first optical axis;

plural objective lens barrels and mounting means for mounting said plural objective lens barrels to said disk, said lens barrels each having a second optical axis that extends parallel to said axis of rotation of said disk, said second optical axes each being arranged on a hypothetical circle on said disk that intersects said first optical axis;

a detent motion arresting means circumferentially provided between said disk and said undersurface of said upper frame for arresting the motion of said disk at each location whereat one of said second optical axes becomes aligned with said first optical axis;

an uprigtht barrel housing and large diameter thread detachable mounting means provided on an upper surface of said upper frame for facilitating a threaded attachment of said barrel housing to said upper frame, said barrel housing having first, second and third openings therein, said first and second openings being axially aligned and having a third optical axis coaxial with said first optical axis, said third opening having a fourth optical axis extending transversely to said third optical axis;

prism means mounted in said barrel housing and in a pathway defined by said coaxial first and third optical axes, said prism means including movable and stationary prism means for separating from said first and third optical axes an image path which is coaxial with said fourth optical axis, said prism means also including first means for effecting said coaxial alignment of said image path with said third optical axis adjacent a lower end of said upright barrel means, and second means for providing a non-inverted image to said fourth optical axis; and

mounting means on an upper end of said upright barrel means for facilitating a mounting of auxiliary optical recording apparatus having an input axis that is in coaxial alignment with said first optical axis.

4,639,099

OPTICAL INSTRUMENT

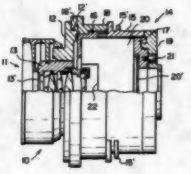
Kazuto Tanaka; Haruo Kakizawa, and Kouichi Nagata, all of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

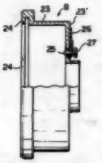
Filed Sep. 12, 1985, Ser. No. 775,248

Claims priority, application Japan, Oct. 6, 1984, 59-210096

Int. Cl.⁴ G02B *23/00*

U.S. Cl. 350—538 **4 Claims**





1. An optical instrument comprising:

(i) a casing;

(ii) at least one telescopic system mounted in said casing and composed of objective and eyepiece lenses;

(iii) an eyepiece mount supported on said casing;

(iv) an eyepiece lens unit detachably mounted on said eyepiece mount and comprising an eyepiece lens assembly including said eyepiece lens and an image intensifier tube assembly separably coupled to said eyepiece lens assembly, said image intensifier tube assembly including an

image intensifier tube having a light-sensitive surface lying at the focal plane of said objective lens and a phosphor screen lying at the focal point of said eyepiece lens, said eyepiece lens assembly having first means for separably coupling the eyepiece lens assembly to said eyepiece mount without said image intensifier tube assembly disposed therebetween, said image intensifier tube assembly having second means for separably coupling the image intensifier tube assembly to said eyepiece mount with said eyepiece lens assembly attached to said image intensifier tube assembly, said first and second means being relatively positioned so that when said eyepiece lens assembly is coupled directly to said eyepiece mount without said image intensifier tube assembly disposed therebetween, said focal point of said eyepiece lens coincides with said focal plane of said objective lens.

4,639,100

ASTIGMATIC OPTICAL ELEMENT, ITS MANUFACTURING PROCESS, ILLUMINATING APPARATUS INCLUDING THE SAME AND ARTICLES TREATED BY THE SAME

Jean P. Arnaud, 23, rue de Pontoise, Moutmorency, F-95160, France

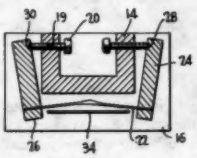
PCT No. PCT/EP83/00146, § 371 Date Feb. 10, 1984, § 102(e) Date Feb. 10, 1984, PCT Pub. No. WO83/04439, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 7, 1983, Ser. No. 584,945

Claims priority, application France, Jun. 11, 1982, 82 10286

Int. Cl.[4] G02B *5/08*

U.S. Cl. 350—611 **4 Claims**



1. Process for forming an optical element, said process comprising the steps of

forming a varied thickness flat member having first and second large faces, said first large face having a polished surface which is selectively planar or a section of a surface of revolution, and said second large face including at least a central portion which is a non-planar ruled surface having plural separate surfaces each defined from a generatrix, and

distorting said flat member by flexing said flat member around generatrices of said separate surfaces of said ruled surface to shape said polished surface as an optical surface which is neither planar nor a section of a surface of revolution.

4,639,101

THREE DIMENSIONAL MIRRORED AQUARIUM ORNAMENT

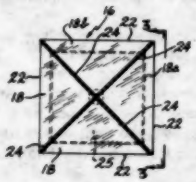
Ronald J. Stefancin, Jr., 4120 Columbia Sq., 101, North Olmsted, Ohio 44070

Filed Apr. 22, 1985, Ser. No. 725,899

Int. Cl.[4] G02B *7/18, 5/08;* A01K *63/00*

U.S. Cl. 350—616 **12 Claims**

1. In combination a fish aquarium and a three dimensional mirrored aquarium ornament disposed in said aquarium, said ornament comprising plural mirror segments each including a base edge and side edges with said segments being disposed in generally abutting edge-to-edge relation to define an enclosure, means in said enclosure for weighting said ornament, and means oriented along abuttting edges of said segments to prevent the ingress of water into said enclosure and to prevent deterioration of the reflective coating of the mirror segments, and wherein said plural mirror segments include four side mirror segments defining a regular pyramidal shape and wherein said ornament includes a bottom wall, said bottom wall having an opening therethrough, and a plug for said



opening to prevent the ingress of water into the interior of said ornament enclosure above said bottom wall.

4,639,102

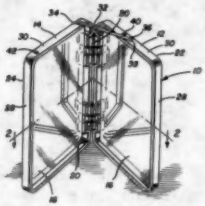
FOLDING DOUBLE MIRROR DEVICE

Paul Fetko, 6200 Rivercliffe Dr., NW., Atlanta, Ga. 30328, and Lawrence C. Zaglin, 3830 Paces Ferry West, NW., Atlanta, Ga. 30339

Filed Feb. 11, 1985, Ser. No. 700,177

Int. Cl.[4] A45D *42/18, 42/00*

U.S. Cl. 350—626 **7 Claims**



1. A folding double mirror assembly including a pair of side-by-side mirror members each having a substantially reflective surface, mounting means pivotally connecting adjacent first marginal portions of said members together for relative swinging of said members between open positions with said reflective surfaces defining an included angle of at least 90° and closed positions with said surfaces disposed in substantially parallel juxtaposed relation, said mounting means including positioning means operative to releasably retentatively retain said mirror members in relatively angularly displaced positions with said reflective surfaces defining an included angle of substantially 75°.

4,639,103

REMOTE CONTROL MULTI-POSITION REAR VIEW MIRROR

Francis K. Hill, P.O. Box 2059, Wickenburg, Ariz. 85358

Continuation of Ser. No. 635,569, Jul. 30, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,317

Int. Cl.[4] G02B *5/08;* A47G *1/24*

U.S. Cl. 350—636 **19 Claims**

1. A remote control multi-position rear view mirror for mounting on a vechicle comprising:

(a) a mirror having opposed reflective and non-reflective faces;

(b) a bracket coupled to the non-reflective face of said mirror and defining a first axis about which said mirror is pivotably movable relative to said bracket between first and second positions;

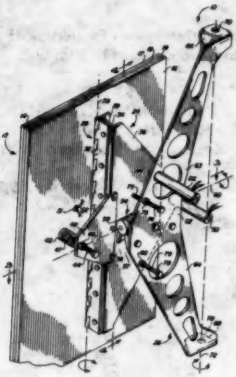
(c) biasing means for urging said mirror to its first position;

(d) first actuator means being remotely actuatable between extended and retracted postions, said first actuator means establishing the first position of said mirror when in the retracted state and moving said mirror to its second position when actuated to its extended state;

(e) first means on said bracket for establishing the second position of said mirror;

(f) a mounting arm for attachment to the vehicle and being adjustable for establishing the position of the mirror relative to the vehicle;

(g) interconnecting means coupling said mirror and said bracket to said mounting arm and defining a second axis about which said mirror and said bracket are movable as an entity between first and second positions, said interconnecting means being disposed so that the second axis defined thereby is at a right angle with respect to said first axis and includes means for biasing that entity to its first position;



(h) second and third means on said mounting arm for respectively establishing the first and second positions of movement of said mirror and said bracket as an entity about said second axis; and

(i) second actuator means being remotely actuatable between extended and retracted positions, said second actuator means moving said mirror and said bracket as an entity about said second axis to the second position thereof when said second actuator means is actuated to its extending state.

4,639,104

SIDEPIECE END OF A SPECTACLE FRAME SIDEPIECE

Hans Gaiser, Thuringer Str. 19, 7410 Reutlingen 24, Fed. Rep. of Germany

Filed May 22, 1985, Ser. No. 736,688

Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419509

Int. Cl.[4] G02C *5/18, 5/14*

U.S. Cl. 351—117 **8 Claims**

1. In a sidepiece end of a spectacle frame from sidepiece, having

a homogeneous metallic tang with a flat profile in the hard bending direction,

a thin sleeve of hard synthetic plastics material having a blind hole for receiving said flat profile,

a small plate extending integrally from said synthetic plastics sleeve having a flat profile and at least one transverse aperture, and

a sheath, of injected synthetic plastics silicone rubber material of a Shore-D hardness of 10–30 according to DIN 53505, surrounding said synthetic plastics sleeve, said small plate and said tang and having an end face at one end remote from said small plate, the improvement wherein:

(a) said synthetic plastics sleeve extends integrally as far as said end face of said sheath and has end walls and side walls that are mutually opposite each other and wider than said end walls,

(b) a plurality of through-passing holes are provided spaced from one another in said mutually opposite side walls of said synthetic plastics sleeve, and

(c) said material of the injection-moulded sheath engages in said holes.

4,639,105

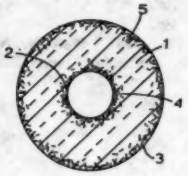
SPIN CAST OCULAR COSMETIC DEVICE WITH COLOR SEPARATION

Charles W. Neefe, 811 Scurry St., Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 751,484, Jul. 3, 1985, which is a continuation-in-part of Ser. No. 740,569, Jun. 3, 1985, which is a continuation-in-part of Ser. No. 642,114, Jul. 17, 1984, Pat. No. 4,534,915, which is a continuation-in-part of Ser. No. 506,873, Jul. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 417,641, Sep. 9, 1982, Pat. No. 4,416,837. This application Aug. 30, 1985, Ser. No. 771,236

Int. Cl.[4] B29D *11/00*

U.S. Cl. 351—162 **14 Claims**



8. A rotationally cast ocular cosmetic device that alters the apparent color of the eye having a plurality of concentric color components and is substantially the size and curvature of the cornea upon which it is placed and has an open central visual aperture substantially the size of the pupil and positioned on the cornea around the pupil of the eye, made from a composition comprising a liquid monomer, a soluble dye and suspended pigment particles, the composition is placed in a concave mold having a central conical protrusion which forms the central visual aperture and the concave mold is rotated around its central axis, some of the suspended pigment particles migrate to the device periphery, other suspended pigment particles remain adjacent to the open central visual aperture, the soluble dye does not migrate, the rotating liquid monomer is allowed to polymerize forming a solid cosmetic device having a plurality of concentric color components surrounding the central open visual aperture.

4,639,106

AIRCRAFT VIDEO PROJECTION SYSTEM

James H. Gradin, Irvine, Calif., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 26, 1985, Ser. No. 727,580

Int. Cl.[4] G03B *21/30*

U.S. Cl. 353—13 **10 Claims**

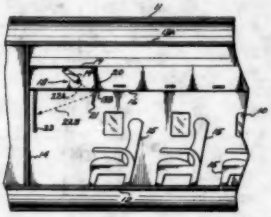
1. A video projection system suitable for mounting above a ceiling of the passenger compartment of an aircraft for displaying video images for passengers embarked on the aircraft comprising:

(a) a video projector positioned above said ceiling in said aircraft passenger compartment, said ceiling having an opening through which said video projector transmits video images along a predetermined first path;

(b) light deflecting means supported in a position of light deflecting alignment relative to said first path, said position of light deflecting alignment being on the side of said

ceiling opposite said video projector, said light deflecting means for deflecting said video images along a predetermined second path; and,

(c) projection screen means supported in a position of light receiving alignment relative to said second path for receiving and displaying to said aircraft passengers the video images deflected along said second path, said first path being no longer than said second path and defining an acute angle with said ceiling.



4,639,107

ACQUIRING MEASUREMENTS OF AN OBJECT BY MEANS OF PHOTOGRAPHY

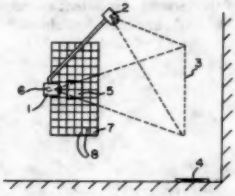
Ulrich M. Landwehr, Bahnhofstr. 8, 1 OG, D-300 Hannover 1, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,862

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425913

Int. Cl.⁴ G03B *29/00*

U.S. Cl. 354—77 **8 Claims**



1. In an imaging method for ascertaining the dimensions of an object by means of photography, including the step of projecting during imaging in an oblique direction a particular pattern of horizontal lines upon the object to be imaged, the improvement comprising:

projecting during photographic imaging a measuring raster of horizontal and vertical lines directly upon and into the imaging plane in a photographic camera.

4,639,108

CODE PLATE

Shinji Sakai, Tokyo; Takashi Kawabata, Kanagawa, and Yoshihito Harada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,284

Claims priority, application Japan, Aug. 31, 1982, 57-150088

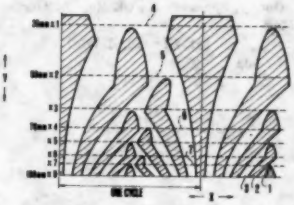
Int. Cl.⁴ G03B *3/10*; G01D *5/249*

U.S. Cl. 354—289.1 **4 Claims**

1. A code plate for a zoom lens, comprising:

a substrate for the code plate; and

a plurality of signal sources arranged and formed on said substrate of the code plate in a first direction in which a member moves as the object distance varies which moves according to a change in a distance to an object to be photographed, and, unlike that of the first detection, said signal sources being arranged to have their spacing intervals variable according to displacement of the member in a second direction in which said displacement takes place in association with a change in the focal length of a phototaking lens and wherein the width of each of said signal sources in the first direction is equal to each of the spacing intervals of said signal sources in said first direction.



4,639,109

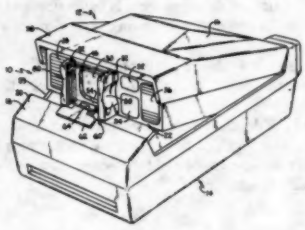
OPTICAL ACCESSORY FOR PHOTOGRAPHIC APPARATUS

William Hudspeth, Norwell, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 3, 1985, Ser. No. 740,852

Int. Cl.⁴ G03B *11/00*; G02B *7/00*

U.S. Cl. 354—295 **5 Claims**



1. An accessory for a photographic apparatus, the apparatus including an objective lens assembly, a housing structure being provided with a recess adjacent the lens assembly, said accessory including:

a frame defining an opening, said frame including means for mounting an optical element in operative relationship with said opening; and,

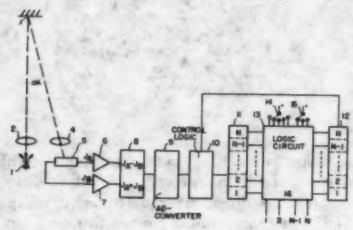
means for releasably attaching said frame to the photographic apparatus so that said frame opening is disposed in general alignment with the lens assembly such that an optical element positioned in said mounting means is in operative optical relationship with respect to the lens assembly;

said attaching means including at least a resiliently flexible member extending from said frame, said member having a section configured to seat in the recess of the housing structure in coupled engagement therewith and a distal end section configured to project forwardly of the housing structure in a location outside the field of view of the lens assembly when said accessory is attached to the photographic apparatus so as to be accessible to an operator's finger to facilitate selective release of said accessory from the photographic apparatus.

4,639,110
AUTOMATIC FOCUSING SYSTEM FOR A PHOTOGRAPHIC CAMERA

Juergen Rinn, Wettenberg, and Fritz Belitz, Pohlheim-Hausen, both of Fed. Rep. of Germany, assignors to Minox GmbH, Giessen, Fed. Rep. of Germany

Filed Sep. 24, 1985, Ser. No. 779,710
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437145
Int. Cl.[4] G03B 3/00
U.S. Cl. 354—403 4 Claims



1. An automatic focusing system for photographic cameras, with an infrared light source, an infrared detector and a focusing optics mounted in front of the detector to focus the infrared radiation reflected from the object on the detector surface, where the detector is divided into two partial detectors each of which supplies a partial current of which the ratio depends directly on the object distance, characterized by the detector (5) being followed by an electronics (6–16) including a computing circuit (16) which by means of an objective-focusing system implements the objective-focus according to a preselection performed on one of the components (selection switch 15) of the electronics in one of the following several modes of operation

(a) focus is on the object to be photographed,
(b) extend the depth of field from the object toward the camera,
(c) extend the depth of field from the object toward the rear
(d) extend the depth of field from the object to infinity
(e) extend the depth of field between two consecutively targeted objects.

4,639,111
PSEUDO FORMAT CAMERA WITH EXPOSURE CONTROL

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1985, Ser. No. 747,515
Int. Cl.[4] G03B 7/099
U.S. Cl. 354—481 13 Claims

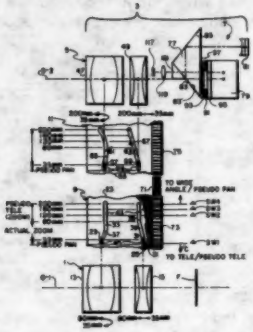
1. A photographic camera for exposing a film frame for use in producing a pseudo telephoto print, said camera comprising:

an objective lens;

manually operated means for selecting a pseudo telephoto field of view reduced from the actual field of view of said objective lens;

exposure control means including a photosensitive element disposed to receive ambient light; and

light control means, responsive to the selection of a pseudo telephoto field of view, for controlling the amount of light reaching said photosensitive element in accordance with the amount of light available to the pseudo telephoto field

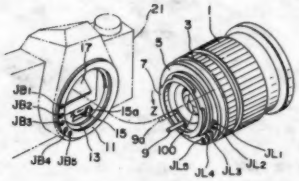


of view, whereby the portion of the film frame covered by the pseudo field of view can be more accurately exposed.

4,639,112
CAMERA SYSTEM CAPABLE OF INTERCHANGING ITS OBJECTIVE LENS

Masaaki Nakai, Nara; Masayoshi Sahara, Sennan; Nobuyuki Taniguchi, Tondabayashi, and Toshihiko Ishimura, Habikino, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 478,910, Mar. 25, 1983, Pat. No. 4,560,267. This application Jul. 19, 1984, Ser. No. 632,405
Claims priority, application Japan, Mar. 26, 1982, 57-49768; Mar. 30, 1982, 57-52740; Apr. 1, 1982, 57-55187; Nov. 5, 1982, 57-194968; Apr. 26, 1984, 59-85599
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[4] G03B 7/20, 7/26
U.S. Cl. 354—455 4 Claims



1. A camera system capable of interchanging an objective lens assembly with another lens assembly, which comprises:

an interchangeable lens assembly comprising

first and second terminals adapted to receive electrical power from a camera body and connectable respectively to a high voltage side and a ground side;

a lens circuit constituted by a C-MOS construction and adapted to receive the electric power from the first and second terminals;

a third terminal adapted to receive an enabling signal from the camera body for bringing the lens circuit into a condition ready to be enabled;

a fourth terminal adapted to receive the clock pulses from the camera body; and

a fifth terminal adapted to transmit there through to the camera body the various data peculiar to the interchangeable lens assembly which are serially outputted from the lens circuit, said first to fifth terminals being arranged in a row along the direction in which the lens assembly is turned, said fifth terminal being located at one end of said row on the leading side with respect to the direction of the

turn of the lens assembly when coupled to the camera body; and

said camera body comprising:

sixth to tenth terminals adapted to be connected respectively with the first to fifth terminals when the lens assembly has been completely coupled to the camera body;

means for outputting a power supply initiating signal in dependence on a manipulation;

a source of the electric power for supplying a voltage on the high voltage side to the sixth terminal through a protective resistor and also for providing the seventh terminal with a ground level;

means for outputting to the eighth terminal a first enabling signal for bringing the lens circuit into a condition ready to be enabled;

means for outputting the clock pulses to the ninth terminal;

a data output means for serially outputting data within the camera body on the basis of the clock pulses;

means for outputting a second enabling signal for bringing the data output means into a condition ready to be enabled at a timing different from the timing at which the lens circuit is enabled; and

a read-out circuit constituted by a C-MOS construction for sequentially reading through a common input terminal on the basis of the clock pulses not only of the various data peculiar to the lens assembly which have been inputted from the tenth terminal, but also the data with in the camera body fed from the data output means.

4,639,113

CAMERA DISPLAY DEVICE

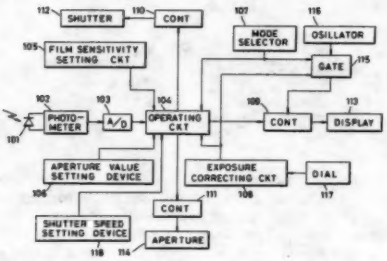
Yuji Ohkubo, Ohmiya, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 782,104

Claims priority, application Japan, Oct. 4, 1984, 59-208787

Int. Cl.[4] G03B *17/18*

U.S. Cl. 354—472 **5 Claims**



1. A camera operative in a first mode as an automatic control mode for automatically controlling at least one of an aperture and a shutter so as to obtain an optimal exposure, and in a second mode for manually controlling an aperture value and a shutter speed to be controlled, and having a member operated in the first mode to deviate an exposure to be controlled from the optimal exposure, including:

(a) detecting means for detecting a deviation of the exposure from the optimal exposure and an exposure deviation direction thereof upon operation of said member in the first mode and generating a first detection signal; and

(b) display means having a plurality of display parts for displaying the deviation and the exposure deviation direction in response to the first detection signal;

(c) said detecting means being adapted to generate a second detection signal representing a deviation of an exposure and an exposure deviation direction thereof obtained as a combination of a manually preset aperture value and shutter speed in the second mode; and

(d) said plurality of display parts being adapted to display the deviation and the exposure deviation direction in response to the second detection signal.

4,639,114

IMAGE-FORMING APPARATUS WITH AUTOMATIC AND MANUAL PAPER FEED MODES

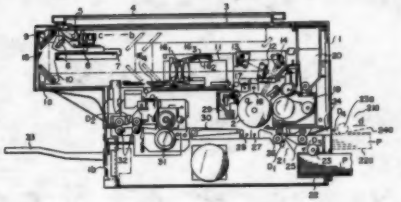
Fumito Ide, Zama, and Hidenori Mochizuki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 24, 1984, Ser. No. 664,291

Claims priority, application Japan, Oct. 25, 1983, 58-198332; Oct. 26, 1983, 58-199124; Oct. 31, 1983, 58-202587

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—35 H **2 Claims**



1. An image forming apparatus with automatic and manual sheet feed modes comprising:

first, detachable, sheet supply cassette means for containing sheets of a first predetermined size for automatic feeding;

second, detachable, sheet supply cassette means for containing sheets of a second predetermined size for automatic feeding, and for permitting manual feeding of a sheet from outside, said second sheet supply cassette means including a manual sheet supply guide which may be selectively moved between a first position, in which said guide permits manual feeding of said sheet from outside, and a second position, in which said guide permits automatic feeding of the sheets contained within said second sheet supply cassette means;

cassette selection means for supplying a command which designates from which of said first and second sheet supply cassette means sheets are to be fed;

first display means for displaying a manual feed mode;

second display means for displaying an automatic feed mode, and the size of the sheets which can be fed in such mode;

first control means for producing a first control signal which causes said second display means to operate in response to the second position assumed by said manual sheet supply guide, and in response to the command from said cassette selection means designating said first or second sheet supply cassette means;

second control means for producing a second control signal which causes said first display means to operate in response to the command from said cassette selection means designating said second sheet supply cassette means, and in response to the first position assumed by said manual sheet supply guide;

third control means for producing, when supplied with the command from said cassette selection means designating said first sheet supply cassette means while said first display means is operating, a third control signal which causes said second display means to operate, and a fourth control signal which causes said first display means to flash;

image data output means for outputting image data that is to be formed; and

image forming means for transferring image data output from said image data output means onto a sheet supplied

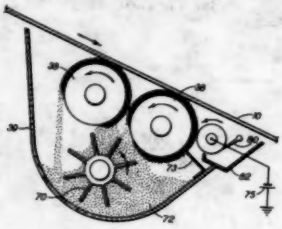
automatically or manually from one of said sheet supply cassette means and said manual sheet supply guide.

4,639,115

DEVELOPMENT APPARATUS WITH PAPER DEBRIS REMOVER

Ying-wei Lin, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1985, Ser. No. 718,615
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD **10 Claims**



1. Apparatus for rendering latent electrostatic images on a charge-retentive surface visible, said apparatus comprising:

means containing a quantity of developer;

at least one magnetic developer roll rotatably supported for rotation in a predetermined direction intermediate said charge retentive surface and said developer containing means;

means for moving developer material from said containing means to said magnetic developer roll, said developer roll being positioned adjacent said charge retentive surface whereby developer carried thereby is presented to said charge retentive surface during rotation of said developer roll; and

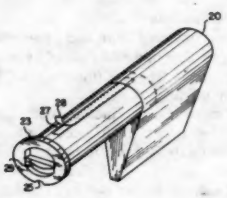
paper debris removal means supported adjacent said magnetic developer roll in a location relative to the developer roll's path of travel whereby a section of said developer roll to which developer material has been attracted is moved by said developer roll into contact with said paper debris removal means prior to contactng said charge retentive surface.

4,639,116

PRINTER/COPIER WITH DISPOSABLE TONER CARTRIDGE

Kensuke Fukae, Allendale, N.J., and Keitaro Yamashita, Saitama, Japan, assignors to Kentek Information Systems, Inc., Allendale, N.J.

Filed Apr. 2, 1985, Ser. No. 718,946
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD **18 Claims**



1. A self-contained developer unit for use in connection with an electrophotographic printing apparatus, said developer unit comprising

a substantially closed housing,

means for receiving a disposable cartridge containing toner,

a mixing chamber wherein said toner and a carrier are mixed,

means for delivering controlled amounts of toner from said cartridge to said mixing chamber,

circuit means for monitoring the toner/carrier mix in said mixing chamber,

means coupled to said delivering means for controlling the amount of toner delivered from said toner cartridge to said mixing chamber in response to signals generated by said circuit means,

means coupled to said mixing chamber for mixing said toner with carrier particles, and

means coupled to said mixing chamber for applying said toner/carrier mix to a photoconductive element to develop a latent electrostatic image,

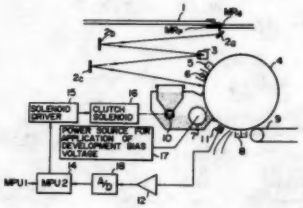
said housing substantially enclosing said disposable cartridge receiving means, said mixing chamber, said delivery means, said mixing means, and said means for applying said toner/carrier mix to said photoconductive element, and at least partially enclosing said circuit means.

4,639,117

RECORDING IMAGE DENSITY CONTROL METHOD FOR ELECTROPHOTOGRAPHY

Kazuo Murai, Tokyo, and Yasushi Koichi, Yamato, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,211
Claims priority, application Japan, Nov. 7, 1981, 56-178891
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **5 Claims**



1. A recording image density control method for electrophotography in which latent electrostatic images are formed on a photoconductor by charging the surface of said photoconductor, followed by exposing the charged surface of said photoconductor to optical images, said latent electrostatic images are developed to toner images by a developer supplied from a development apparatus, and said toner images are transferred to a transfer sheet under application of image transfer charges thereto, comprising the steps of:

forming at least two latent electrostatic image patterns with different electric potentials on the surface of said photoconductor;

developing said latent electrostatic images patterns to toner image patterns by use of toner contained in said developer;

detecting a value relating to the image density of each said developed toner image pattern, with a different resolution for each said developed toner image pattern, by (1) converting the image density to an image density detection voltage, (2) dividing said image density detecting voltage into at least two image density detecting voltages with predetermined ratios, a direct image density detection voltage and a divided image density detection voltage, (3) inputting said direct image density voltage to a first channel of an A/D converter and said divided image density voltage to a second channel of said A/D converter, (4) comparing said direct image density voltage with a refer-

ence voltage, and when said direct image density voltage is not greater than said reference voltage, and direct image density voltage is employed as said value relating to the detected image density, while when said direct image density is greater than said reference voltage, said divided image density voltage input to said second channel of said A/D converter is employed as said value relating to the detected image density;

determining the ratio said value for one image pattern to said value for the other image pattern; and

controlling a recording image density controlling parameter in accordance with said ratio.

4,639,118

PHOTOGRAPHIC PAPER ACCOMMODATING APPARATUS

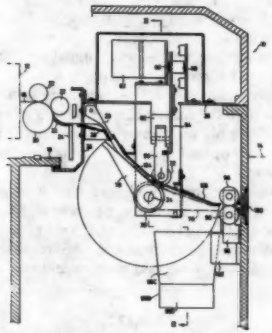
Mikio Kogane; Kenji Suzuki; Eiichi Kito; Kazufumi Kubota, and Kanji Tokuda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 1, 1985, Ser. No. 794,030

Claims priority, application Japan, Nov. 1, 1984, 59-230977

Int. Cl.⁴ G03B *29/00*

U.S. Cl. 355—29 **22 Claims**



1. A photographic paper accommodating apparatus which is disposed on the downstream side of a photographic paper printing section for feeding an exposed continuous photographic paper to a subsequent step, said apparatus comprising:

(a) first clamping and transporting rollers disposed on the downstream side of said printing section so as to clamp and transport said photographic paper and define a first photographic paper looping area between said printing section and said rollers;

(b) second clamping and transporting rollers disposed on the downstream side of said first clamping and transporting rollers so as to clamp and transport said photographic paper and define a second photographic paper looping area between said first and second clamping and transporting rollers; and

(c) a guide member movable between at least two, that is, first and second, positions, at which first position said guide member is disposed between said printing section and said first clamping and transporting rollers so as to guide the leading end portion of said photographic paper to said first clamping and transporting rollers, and at which second position said guide member is disposed between said first and second clamping and transporting rollers so as to guide the leading end portion of said photographic paper to said second clamping and transporting rollers.

4,639,119

PROCESS KIT AND AN IMAGE FORMATION APPARATUS USING THE PROCESS KIT

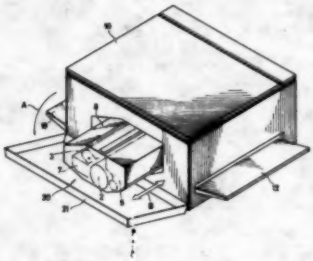
Kazuo Isaka, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

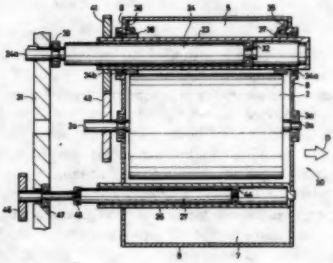
Continuation of Ser. No. 374,055, May 3, 1982, abandoned. This application Mar. 22, 1985, Ser. No. 715,578

Claims priority, application Japan, May 12, 1981, 56-71227

Int. Cl.⁴ G03G *15/09*

U.S. Cl. 355—3 DD **14 Claims**





1. A process kit removably mountable with respect to the body of an image formation apparatus, said process kit having:

a housing,

a magnetic powder carrying member for carrying magnetic powder developer on the peripheral surface thereof by a magnetic field generated by magnetic field generating means disposed on the opposite side from the magnetic powder carrying surface of said magnetic powder carrying member when the process kit is inserted in the apparatus body,

a latent image carrying member on which an image can be developed using the magnetic powder developer,

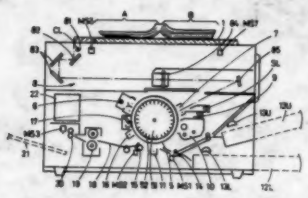
a support member for said magnetic powder carrying member which rotatably supports said carrying member on the housing of said process kit, and

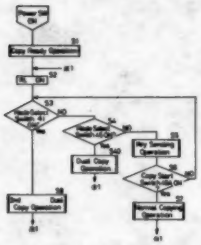
means defining an opening in said magnetic powder carrying member dimensioned to accept the insertion therein of the magnetic field generating means, which is mounted on the apparatus body, when said process kit is inserted in the apparatus body.

4,639,120
INDEPENDENT DUAL ELECTROPHOTOGRAPHIC COPYING MACHINE

Hirokazu Matsuura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 12, 1985, Ser. No. 700,971
Claims priority, application Japan, Feb. 15, 1984, 59-27612
Int. Cl.[4] G03G 15/22
U.S. Cl. 355—14 R 7 Claims





1. A control system in a dual electrophotographic copying machine, comprising:

document table means for receiving one or more copy documents positioned to correspond to first and second halves of a total area of said document table means;

copy start means for initiating a copying operation of a copy document disposed on said document table means;

mode selection means for selecting either a simple dual copying operation mode or a second dual copying operation mode, said simple dual copying operation mode being for copying said one or more copy documents positioned on first and second halves of said document table means onto one or both sides of identical size copy papers from a single paper cassette for a same number of copies for each document table half, and said second dual copying operation mode being for copying said one or more copy documents positioned on first and second halves of said document table means onto two different-size copy papers selected from two different paper cassettes for a same or different number of copies;

automatic mode selection means for automatically selecting a normal copying operation mode in the absence of an actuation of said copy start means in either of said simple or second dual-copying operation modes;

selection means, responsive to said mode selection means, for selecting and inputting copy information associated with said first and second halves of said document table means;

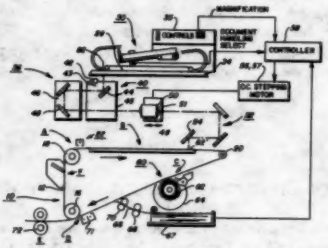
detection means, responsive to said selection means, for detecting which of said input copy information relates to either of said first or second halves of said document table means; and

control means, responsive to said detection means, for executing a selected copying operation mode upon actuation of said copy start means.

4,639,121
DOCUMENT REGISTRATION SYSTEM

John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1985, Ser. No. 748,071
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—14 R 8 Claims



1. An imaging system for a document reproduction machine including:

a transparent platen for supporting a document to be reproduced, said platen having a first horizontal edge registration position associated with a first mode of operation and a second horizontal edge registration position associated with a second mode of operation,

means for generating an electrical signal indicative of said first or second registration position,

an illumination scan assembly for scanning said document,

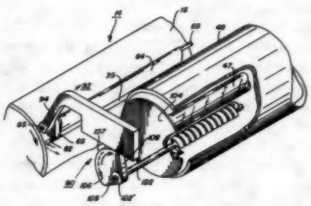
an optical system for forming latent images of said scanned document on a photoreceptor surface moving in a process direction, said optical system including a movable projection lens, and

control means adapted to receive said electrical signals corresponding to registration position and to move said lens in a direction perpendicular to said process direction so as to maintain a centered and edge-registered position of said latent image on said photoreceptor.

4,639,122
CONTROL FOR RETRACTING THE CLEANING BLADE OF A REPRODUCTION OR PRINTING MACHINE WHEN THE MACHINE IS NOT IN USE

Donald L. Pease, Honeoye, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1986, Ser. No. 818,929
Int. Cl.[4] G03G 21/00
U.S. Cl. 355—15 8 Claims



1. In a reproduction machine having a recording member with an imaging surface on which latent electrostatic images are formed, developing means for developing images on the recording member surface, transfer means for transferring developed images to copy substrate material, fuser means for fixing developed images transferred to the copy substrate

material, and cleaning means for cleaning the recording member surface after transfer, the cleaning means including a blade having a cleaning edge; the combination of:

(a) means for supporting said blade for movement between an operative position where said blade cleaning edge engages the recording member surface and an inoperative position where said blade cleaning edge is disengaged from the recording member surface;

(b) bias means for biasing said blade so that said blade cleaning edge is in one of said operative and inoperative positions; and

(c) temperature monitoring means for monitoring temperature conditions of said fuser means, said temperature monitoring means responding to a preset temperature condition of said fuser means to overcome said bias means and move said blade so that said blade cleaning edge is in the other of said operative and inoperative positions.

4,639,123

CLEANING DEVICE

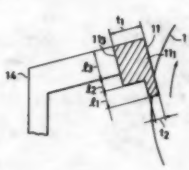
Hiroyuki Adachi, Hachioji, and Takashi Saito, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

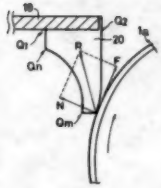
Filed Jan. 9, 1984, Ser. No. 569,023

Claims priority, application Japan, Jan. 11, 1983, 58-2633

Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—15 **10 Claims**





1. A cleaning device for cleaning a surface to be cleaned, comprising:

an elastic cleaning blade contacting the surface to be cleaned so as to clean said surface;

a support member supporting said elastic cleaning blade in such a manner that said cleaning blade contacts said surface to be cleaned while opposing a direction in which the surface to be cleaned moves; and

receiving means for receiving objects removed by said elastic cleaning blade from the surface to be cleaned;

wherein said elastic cleaning blade includes a substantially rectangular fore end portion which contacts the surface to be cleaned and which has a thickness less than at where said blade is supported by said support member.

4,639,124

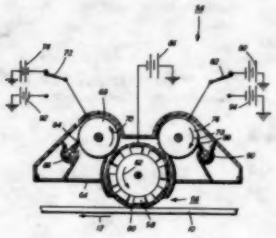
CLEANING SYSTEM FOR A MULTICOLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE

Leroy M. Nye, Jr., Ontario, and Thomas W. Pike, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 7, 1985, Ser. No. 795,947

Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—15 **21 Claims**



1. An apparatus for removing particles of at least two different colors from a surface during two operating cycles, including:

a particle removing member;

first means for attracting the particles of one color from said removing member thereto;

second means for attracting the particles of the other color from said removing member thereto; and

means for electrically biasing said first attracting means and said second attracting means to a plurality of voltage levels with said first attracting means being electrically biased to a voltage level so as to attract the particles of one color from said removing member thereto during one cycle of the apparatus with said second attracting means being electrically biased to a voltage level so that substantially no particles are attracted thereto, and said second attracting means being electrically biased to a voltage level so as to attract particles of the other color from said removing member thereto during the other cycle of the apparatus with said first attracting means being electrically biased to a voltage level so that substantially no particles are attracted thereto.

4,639,125

AUTOMATIC DUPLEX COPYING TYPE COPYING APPARATUS

Masakiyo Okuda, Kashiwara; Kazuyuki Ohnishi, and Akira Mitsuyama, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 20, 1985, Ser. No. 811,478

Claims priority, application Japan, Dec. 26, 1984, 59-276620; Dec. 27, 1984, 59-276568

Int. Cl.⁴ G03B *27/32, 27/52*

U.S. Cl. 355—23 **14 Claims**

1. An automatic duplex copying type copying apparatus for automatically copying opposite copying faces of an original document onto opposite faces of a copy paper sheet, respectively, which has a function of returning the original document to an original feeding member through turnover of the original document after one copying face of the original document placed on an original platform has been copied onto one face of the copy paper sheet and a function of copying the other copying face of the original document onto the other face of the copy paper sheet by turning over the copy paper sheet having the one face copied from the one copying face of the original document, said copying apparatus comprising:

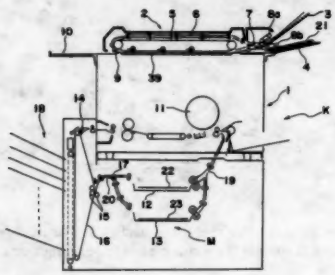
first and second trays for sequentially accommodating first and second copy paper sheets, respectively;

an original feeding means for continuously feeding first and

second original documents from said original feeding member to said original platform;

a transport means for transporting the first and second copy paper sheets to said first and second trays, respectively after one copying face of the first original document and one copying face of the second original document have been copied onto one face of the first copy paper sheet and one face of the second copy paper sheet, respectively;

an original returning means for returning the first and second copy paper sheets from said original platform to said original feeding member through turnover of the first and



second original documents after the one copying face of the first original document and the one copying face of the second original document have been copied onto the one face of the first copy paper sheet and the one face of the second copy paper sheet, respectively; and

a paper feeding means for feeding the first and second copy paper sheets from said first and second trays, respectively such that the other copying face of the first original document and the other copying face of the second original document are copied onto the other face of the first copy paper sheet and the other face of the second copy paper sheet, respectively.

4,639,126

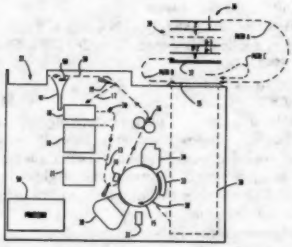
METHOD FOR PRODUCING DUPLEX COPY SETS FROM A DUPLEX ORIGINAL SET

Kenneth A. Bushaw; Louis A. Bustamante, both of Longmont, and James J. McCurry, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1985, Ser. No. 795,950

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 SH **9 Claims**



1. A method of duplex-to-duplex copying which comprises copying both sides of a collated duplex original document set of N sheets, in order to produce M collated duplex copy sets of said original document set, comprising the steps of:

a. circulating each of said N sheets sequentially to an imaging station, and producing one copy of like-sides of each of said N sheets, each copy being produced on a sheet of blank copy substrate;

b. supplying the substrate sheets processed in step-a to a sheet accumulator, to thereby form a stack of N copy sheets, each sheet having an image thereof;

c. circulating each of said N sheets sequentially to said imaging station and producing two copies of the opposite side of each of said N sheets, one of said two copies being produced on the blank side of a sheet taken from said accumulator, and the other copy being produced on a sheet of blank copy substrate;

d. supplying the substrate sheets taken from the accumulator in step-c to an output means, to thereby complete the making of a copy set, and supplying the copies made on said blank copy substrate in step-c to said accumulator;

e. circulating each of said N sheets sequentially to said imaging station and producing two copies of said like-sides, one of said two copies being produced on the blank side of a sheet taken from said accumulator, and the other copy being produced on a sheet of blank copy substrate;

f. supplying the substrate sheets taken from the accumulator in step-e to said output means, to thereby complete the making of a copy set, and supplying the copies made on said blank copy substrate in step-e to said accumulator;

g. repeating step-c through step-f until M−1 copy sets have been made;

h. circulating each of said N sheets sequentially to said imaging station and producing one copy of the appropriate side of each of said N sheets on the blank side of a sheet taken from said accumulator; and

i. supplying the substrate sheets taken from said accumulator in step-h to said output means, to thereby complete the making of the Mth copy set.

4,639,127

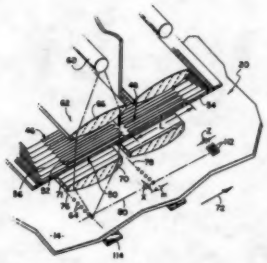
EXPOSURE APPARATUS FOR PRINTING SYSTEM

Jack Beery, Fremont, and Barry G. Broome, Glendora, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 10, 1985, Ser. No. 807,417

Int. Cl.[4] G03B *27/72, 27/76*

U.S. Cl. 355—35 **18 Claims**



1. Apparatus for selectively exposing each of a multiplicity of subminiature areas of a photosensitive layer of photosensitive material, to light, comprising:

means defining an exposure station for positioning a photosensitive layer to be exposed;

means for moving the photosensitive layer in a predetermined direction past said exposure station;

a row of independently operable light shutters, each shutter including a shutter area and being independently operable to an open state to pass light through a corresponding shutter area, and to a closed state to substantially block the passage of light through the shutter area;

means for directing light at the locations of said shutter areas, and for focusing light that passes through the shutter area of each open shutter onto a different pixel of a row of pixels that lie at the position of a photosensitive layer at

the exposure station, said row of pixels extending largely perpendicular to the direction of movement of said layer past said exposure station;

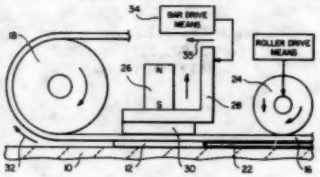
each shutter area having a length which is a plurality of time greater than its average width, and said focusing means focuses light passing through each shutter area onto a corresponding one of said pixels, said corresponding one having a length parallel to the direction of movement of the layer which is less than the length of said each shutter area.

4,639,128

AUTOMATIC PLATEN DOCUMENT STOP FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS HAVING AN AUTOMATIC FEED ARRANGEMENT

Carl P. Anderson, Menlo Park, Calif., assignor to Ricoh Company, Ltd., Tokyo, Japan and Ricoh Systems, Inc., San Jose, Calif.

Filed Mar. 8, 1985, Ser. No. 710,001
Int. Cl.[4] G03B 27/62; G03G 15/00
U.S. Cl. 355—75 **5 Claims**



1. In an electrophotographic copying apparatus designed to make a copy of a document automatically fed into an imaging station comprising a platen aligned with an electrophotographic drum, a belt movable along a path over the surface of the platen to carry said document into alignment with said image station, a document stop located between said belt and said platen comprising a metal strip extending substantially across the full width of the document path and means adjacent the platen for restraining the metal strip against movement along the path of the paper, and means for moving said document stop from a first position interrupting said path to a second position above and adjacent said path comprising a magnetic device aligned with the metal strip and separated from said stop by the belt, movement of said magnetic device carrying said metal strip therewith from said first position to said second position.

4,639,129

METHOD OF MEASURING DISTANCE BETWEEN TWO OBSERVATION POINTS

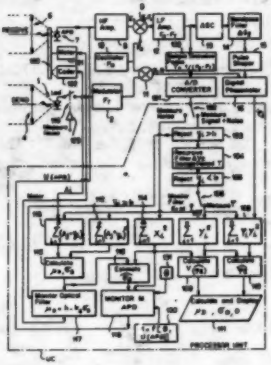
Francois Hullein, and Gérard Fribault, both of Nantes, France, assignors to Societe d'Etudes, Recherche et Constructions Electroniques-Sercel, Carquefou, France

Filed Nov. 30, 1984, Ser. No. 676,887
Claims priority, application France, Dec. 1, 1983, 83 19234
Int. Cl.[4] G01C 3/08
U.S. Cl. 356—5 **30 Claims**

1. A method of determining the distance between two points comprising the steps consisting in emitting oscillator modulated electromagnetic radiation from a first point towards a second point, in reflecting the said electromagnetic radiation from the second point back towards the first point, in receiving the reflected electromagnetic radiation at the first point by means of a receiver, in comparing the phase of a first signal derived from the receiver and of a second signal derived from the emission modulation, and in generating phase samples ϕ_i representative of the phase difference between the first and second signals, the improvement wherein the method further includes the following steps:

(i) in generating a signal representative of the instantaneous variance $V(\phi_i)$ of the phase samples ϕ_i;

(ii) in generating as an estimation of the phase an intermediate signal derived from the average ϕ_g of n phase samples ϕ_i weighted by their instantaneous variance;



(iii) in generating a useful signal representative of the value of the distance D on the basis of the phase estimation ϕ_E; and

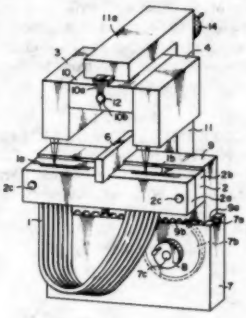
(iv) in displaying this distance value.

4,639,130

INSPECTION APPARATUS FOR OPTICAL FIBER ASSEMBLY

Kazuyoshi Koike, and Yasuteru Tahara, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1985, Ser. No. 749,422
Claims priority, application Japan, Jun. 29, 1984, 59-134182
Int. Cl.[4] G01N 21/84
U.S. Cl. 356—73.1 **12 Claims**



1. An apparatus for inspecting an optical fiber assembly composed of a plurality of optical fibers having light receiving and emitting ends, in such a manner as to measure irregularities in transmission loss of said optical fibers, comprising: a base; a first slider block slidably laid on said base; gripping means attached to said first slider block and adapted to grip both ends of said optical fiber assembly in a manner that they are substantially flush with each other; a feed mechanism for feeding said first slider block by sliding the same on said base; a frame member secured to said base; a second block carried by said frame member; a light projector carried by said second slider block, and adapted to irradiate a light beam onto said light receiving end of one of said optical fibers; a light receiver

carried by said second slider block and adapted to receive a light beam from said light emitting end of said one of said optical fibers; and a light stop mechanism disposed in said light projector and adapted to stop said light beam irradiated by said light projector, so that said light beam may be irradiated, exclusively, onto said light receiving end of only one of said optical fibers and within the same.

4,639,131

DEVICE FOR MEASURING THE STATIC LIVES OF OPTICAL FIBERS

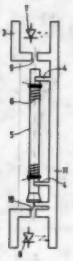
Nicolaus Maan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1985, Ser. No. 774,422

Claims priority, application Netherlands, Sep. 18, 1984, 8402857

Int. Cl.[4] G01N *21/84*

U.S. Cl. 356—73.1 **6 Claims**



1. An apparatus for measuring the static lives of glass optical fibers, said apparatus comprising:

a number of cylindrical rods, each rod being wound with an optical fiber under stress;

a number of holders, each holder holding one rod;

a number of three-sided enclosures, each enclosure surrounding each holder on three sides such that on rupture of a fiber the broken fiber ends strike the enclosure to eject the rod on which the fiber was wound from its holder; and

means for recording the times rods are inserted in holders and the times rods are ejected from holders.

4,639,132

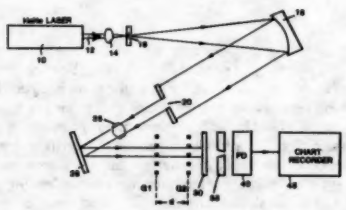
DIRECT DETERMINATION OF MODULATION TRANSFER FUNCTION BY MOIRE DEFLECTROMETRY

Ilana Glatt, Beer-Sheva; Aminadav Livnat, Arad, and Oded Kafri, Beer-Sheva, all of Israel, assignors to The State of Israel

Filed Jul. 3, 1984, Ser. No. 627,657

Int. Cl.[4] G01M *11/00*

U.S. Cl. 356—124.5 **7 Claims**



4. Apparatus for determining the modulation transfer function of an optical system, said apparatus comprising

means for producing a parallel beam of light;

first directing means for directing said beam to said optical system;

a pair of spaced apart grating having a predetermined angular orientation;

said directing means for directing light from said optical system on to said gratings so as to form a moire pattern;

means for varying the spacing of said gratings; and

means for detecting and recording the contrast of said moire pattern as a function of the spacing so as thereby to determine the modulation transfer function.

4,639,133

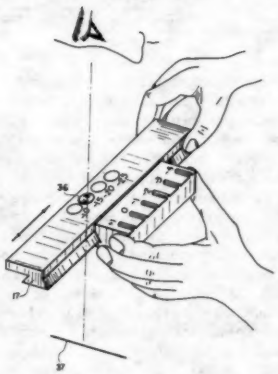
METHOD AND APPARATUS FOR TESTING THE POWER OF A LENS

Rex W. Cole, Warden at Thorpe La., San Marcos, Tex. 78666

Filed May 6, 1985, Ser. No. 731,043

Int. Cl.[4] G01B *9/00*

U.S. Cl. 356—125 **5 Claims**



1. Apparatus for testing the power of an intraocular lens comprising:

(a) a first rigid substantially flat plate of elongated rectangular configuration having two long sides and two short sides, and having a first series of circular apertures positioned in a straight line adjacent one long side and holding minus lenses of equal diameter on optical axes perpendicular to said plate, said lenses having dioptric power between about −10 and −30 as measured in water sequentially arranged within said series,

(b) a second rigid plate having a second series of circular apertures positioned in a straight line and adapted to align with the apertures of said first series, said second series of apertures containing lenses of low dioptric power ranging from about +1 to −4 disposed on optical axes adapted to coincide with the axes of the lenses of said first series, and indexing ridges associated with said lenses and extending upwardly from said plate,

(c) means to permit sliding interengagement of said first and second plates in a manner permitting coaxial alignment of lenses of said first and second series, and

(d) indicia on each plate designating the power of each lens.

4,639,134
PROCESS AND CIRCUIT ARRANGEMENT FOR AMPLIFYING AN INPUT CURRENT

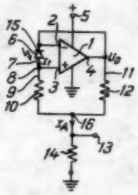
Walter Bletz, Braunfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,551

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321503

Int. Cl.⁴ G01J *1/44, 1/46*

U.S. Cl. 356—223 **16 Claims**



1. A process for amplifying a photoelectric current generated by a photoelectric transducer and present at the input of a circuit arrangement including a feedback-coupled operational amplifier, comprising:

(a) forming two virtually equal voltages by passing the current from said photoelectric transducer through a first impedance to provide a first voltage at an input of the amplifier and producing a virtually identical voltage at an output of said amplifier;

(b) forming two current paths having a common connection point, the current in one current path being determined solely by the photoelectric transducer independently of said operational amplifier, while the current in the other current path is determined by impressing said virtually identical voltage at the output of said amplifier across a second impedance; and

(c) adding the currents of the two current paths at said common connector point to produce an output current greater than that produced by said photoelectric transducer, said output current being a function of the ratio of the first and second impedances as well as the magnitude of the current generated by the photoelectric transducer.

4,639,135
CUVETTE

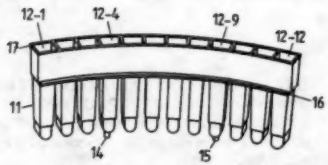
Claude Borer, Hünenberg, and Andreas Greter, Steinhausen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 19, 1985, Ser. No. 702,522

Claims priority, application Switzerland, Feb. 23, 1984, 896/84

Int. Cl.⁴ G01N *21/03*

U.S. Cl. 356—246 **2 Claims**



1. A cuvette arrangement for use in a chemical analysis system, which cuvette arrangement comprises an integrally formed, partially annular unit which defines a plurality of chambers for the receipt of sample-reagent mixtures, wherein each chamber includes the following elements:

(a) an open and a closed end,

(b) an outer side wall forming an outer edge which fits into a first arc,

(c) an inner side wall forming an inner edge which fits into a second arc concentric with the first arc,

(d) a bottom wall extending between the outer and inner side walls at the closed end of the chamber, and

(e) windows which enable radiation energy to be transmitted through the chamber with low loss and free from distortion, which windows comprise a pair of flat, mutually parallel parts which are separated from one another by a defined distance, one of the flat parts in each pair being integrated with the outer side wall and the other of the flat parts in each pair being integrated with the inner side wall,

said annular unit also including means for positioning it in the chemical analysis system, which positioning means comprises the following elements:

(f) a lip which is integrated with the inner side walls and extends radially from the latter on the outside of the chambers, and

(g) a projection which extends from the outside of the bottom wall of at least one of the chambers and along the longitudinal axis of the chamber.

4,639,136
ELECTROTHERMAL ATOMISER

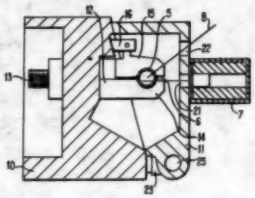
Stephen F. N. Morton, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 28, 1985, Ser. No. 738,003

Claims priority, application United Kingdom, Jun. 20, 1984, 8415682

Int. Cl.⁴ G01N *21/74*

U.S. Cl. 356—312 **6 Claims**



1. An electrothermal atomizer for a spectrophotometer, said atomizer comprising a hollow body of electrically conductive material, probe means for holding a sample in the interior of said hollow body, dosing means for depositing said sample onto said probe means within said interior, actuator means for inserting said probe means into said interior, and means for passing an electrical current through said hollow body to heat said interior to a temperature sufficient to atomize said sample, wherein at least a portion of said probe means on which said sample is deposited is of electrographite.

4,639,137
METHOD OF AND DEVICE FOR DETERMINING WHEN A LIQUID-RENEWAL PROCESS IS TO BE TERMINATED

Jean-Pierre Hazan, Sucy-en-Brie, and Michel Steers, Chennevieres-sur-Marne, both of France, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jan. 15, 1985, Ser. No. 691,597

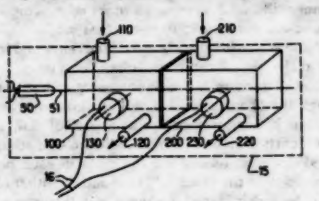
Claims priority, application France, Jan. 23, 1984, 84 00980

Int. Cl.⁴ G01N *21/53*

U.S. Cl. 356—339 **7 Claims**

1. A method of renewing a used liquid for reuse of the same, which includes establishing a body of a reference liquid for comparison with renewed used liquid; establishing a separate body of the used liquid adjacent the body of reference liquid; producing an incident light beam for consecutive traversal of the body of used liquid and the body of reference liquid, the

particles in the two liquid bodies thereby diffusing the light beam to provide respective luminous fluxes off the axis of said incident light beam; separately detecting said two luminous



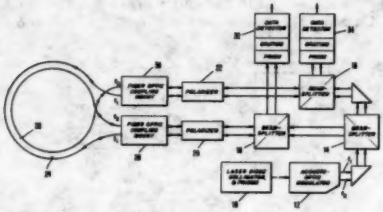
light fluxes and comparing the same; and automatically terminating such procedure when the detected luminous light fluxes are substantially equal to each other.

4,639,138

FIBER-OPTIC ROTATION RATE SENSOR HAVING DUAL INTERFEROMETER LOOPS

James M. Martin, Orlando; William S. Brockett, Mt. Dora; Ronald R. Selleck, Winter Park, and Michael G. Croteau, Orlando, all of Fla., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Oct. 29, 1984, Ser. No. 665,474
Int. Cl.[4] G01B *9/02*; G01C *19/64*
U.S. Cl. 356—350 **13 Claims**



1. A fiber optic rotation rate sensor, for measuring angular rotation rate about an axis, comprising:

a first fiber-optic loop that is disposed to rotate about said axis;

a second fiber-optic loop disposed to rotate about said axis with said first fiber-optic loop;

means for generating coherent light at a first frequency and introducing said light into each end of said first fiber-optic loop so that two beams of light at said first frequency travel around said first loop in opposite directions;

means for generating coherent light at a second frequency and introducing said light into each end of said second fiber-optic loop so that two beams of light at said second frequency travel around said second loop in opposite directions;

a first detector which receives the light beam emerging from one end of each of said two fiber-optic loops and produces a first output signal indicative of the difference in frequency between said first and second frequencies;

a second detector which receives the light beam emerging from the other end of each of said two fiber-optic loops and produces a second output signal indicative of the difference in frequency between said first and second frequencies; and

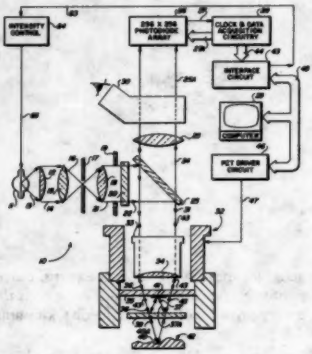
means for comparing said first and second output signals and generating a signal indicative of the phase difference between said output signals.

4,639,139

OPTICAL PROFILER USING IMPROVED PHASE SHIFTING INTERFEROMETRY

James C. Wyant, and Keith N. Prettyjohns, both of Tucson, Ariz., assignors to Wyko Corporation, Tucson, Ariz.

Filed Sep. 27, 1985, Ser. No. 781,261
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—359 **24 Claims**



1. A method of producing information representing the distribution of the phase difference between first and second interfering beams, the first and second interfering beams producing an interference pattern, the method comprising the steps of:

(a) changing the phase difference between the first and second beams at a constant rate;

(b) guiding the interference pattern into an array of photodetectors;

(c) integrating photocurrents produced by the individual photodetectors, respectively, to produce integrated buckets that correspond to intensities of various points across the interference pattern;

(d) measuring first, second, third and fourth integrated buckets produced by each photodetector at times that correspond to first, second, third, and fourth approximately 90 degree changes in the phase difference between the first and second beams while continuously maintaining the rate of change of the phase difference between the first and second beams at a constant value;

(e) computing a first phase value corresponding to each photodetector from the first, second, and third integrated buckets produced by that photodetector;

(f) computing a second phase value, corresponding to each photodetector, from the second, third, and fourth integrated buckets produced by that photodetector; and

(g) adding the first and second phase values corresponding to each of the photodetectors to cancel sinusoidal error produced by small errors in the approximately 90 degree changes in the phase difference between the first and second beams.

4,639,140

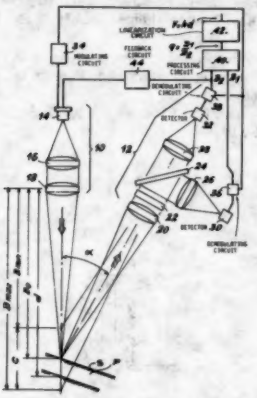
OPTICAL SURFACE PROXIMITY MEASURING DEVICE AND ITS APPLICATION TO THE PLOTTING OF THE PROFILE OF A SURFACE

Bernard Lerat, Igny, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 26, 1985, Ser. No. 705,734
Claims priority, application France, Feb. 29, 1984, 84 03168
Int. Cl.[4] G01B *11/24*
U.S. Cl. 356—376 **11 Claims**

11. An optical device for plotting the profile of a surface, comprising a surface proximity measuring device having a

radiation emitter supplying an incident light beam forming a light spot on a surface, a receiver comprising first and second detectors respectively measuring light fluxes returned by said surface from said light spot through first and second focusing means respectively arranged between said surface and said first and second detectors, said first and second focusing means having different focal lengths, wherein said device further



comprises processing means connected to said first and second detectors, said processing means supplying an output signal having a value equal to the ratio between the light fluxes measured by said first and second detectors, said value being a function of the distance separating the device from said surface and means for bringing about a scan of the profile of said surface by said surface proximity measuring device.

4,639,141

SCANNING RAY BEAM GENERATOR FOR OPTICAL MEASURING DEVICE

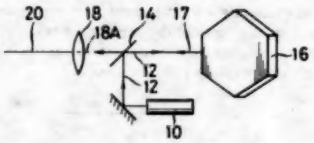
Yoshiharu Kuwabara, and Hiroyoshi Hamada, both of Kanagawa, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,292

Claims priority, application Japan, Nov. 12, 1982, 57-198508; Nov. 16, 1982, 57-200977

Int. Cl.⁴ G01B *11/08*

U.S. Cl. 356—387 **12 Claims**



1. An optical measuring device comprising:

a parallel scanning ray beam generator including a polygonal rotary mirror for reflecting incident ray beams from a beam generator and converting the same into rotary scanning ray beams and a collimator lens for converting the rotary scanning ray beam into parallel scanning ray beams; and

a light receiving element for detecting a presence or absence of the parallel scanning ray beams which have been directed at a workpiece to be measured;

whereby a dimension in the scanning direction of the workpiece to be measured is sought from a length of time of an absence of said parallel scanning ray beams is detected due to the obstruction of part of the parallel scanning ray beams by the workpiece to be measured which is interposed between the parallel scanning ray beam generator and the light receiving element.

characterized in that at least a mirror out of the beam generator and a mirror for reflecting the ray beams from the beam generator and projecting the same to the rotary mirror and the collimator lens are mounted onto one bedplate, and a base of the rotary mirror is made rotatable with respect to the one bedplate about a pin stem and a pin hole disposed on an axial line passing through an intersection between the optical axis of the collimator lens and a reflecting surface of the rotary mirror and perpendicularly intersecting a plane incorporating the incident optical axis of the ray beams into the rotary mirror and the optical axis of the collimator lens.

4,639,142

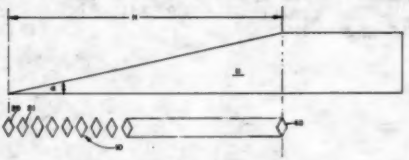
DIMENSION MONITORING TECHNIQUE FOR SEMICONDUCTOR FABRICATION

Pei-Ming D. Chow, Yorba Linda, and Keh-Fei C. Chi, Torrance, both of Calif., assignors to Rockwell International Corporation, Anaheim, Calif.

Filed Apr. 13, 1983, Ser. No. 484,666

Int. Cl.⁴ G01B *11/00*

U.S. Cl. 356—372 **4 Claims**



1. A method of visually monitoring the change in dimensions of elements on a surface of a semiconductor body during processing thereof comprising the steps of:

providing a fixed pattern of images on said surface having a predetermined distance between said images;

providing a wedge-shaped element on said surface having an apex adjacent one of said images and extending in a direction along other ones of said images;

processing said semiconductor body in a predetermined manner causing the dimensions of said wedge-shaped element to change;

subsequently visually inspecting the wedge shaped element with respect to the pattern of images to determine the extent of the change in dimension of said wedge shaped element during processing.

4,639,143

EXTRUSION SCREW

James D. Frankland, Jr., New Castle, Pa., assignor to New Castle Industries, Inc., New Castle, Pa.

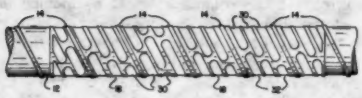
Filed Feb. 28, 1985, Ser. No. 706,405

Int. Cl.⁴ B01F *7/08*; B29B *1/06*

U.S. Cl. 366—89 **11 Claims**

1. In an extruder of the variety including a body having a bore, said body having an inlet and an outlet adjacent opposite ends of said bore, a shaft rotatably supported in said bore, at least one helical flight means on said shaft extending along its length and defining a helical channel for conveying a material from said inlet toward said outlet upon rotation of said shaft wherein said material is changed from a solid phase to a viscous phase, said shaft including along its length at least a feed section adjacent said inlet, an intermediate melt section, and a metering section adjacent said outlet, the improvement comprising:

a longitudinal portion in at least one of said sections having a plurality of discrete closed-ended grooves arranged in a discontinuous helix cut into said channel, said plurality of grooves being dimensioned to so receive said material



therein as said material is conveyed through said channel to said outlet that an average shear force is imparted to said material to reduce the temperature of said material while maintaining the output of said material at a predetermined rate.

4,639,144

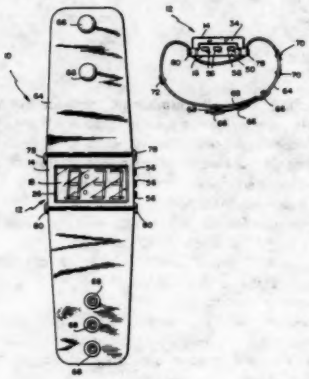
NOVELTY WRIST WATCH

Jacky Chau, Hong Kong, Hong Kong, assignor to Big Time, Inc., West Hemstead, N.Y.

Continuation-in-part of Ser. No. 750,918, Jul. 1, 1982, Pat. No. Des. 285,288. This application Dec. 16, 1985, Ser. No. 809,388

Int. Cl.[4] G04B *37/00*; A44C *5/18*

U.S. Cl. 368—276 **20 Claims**



1. A novelty wrist watch comprising a molded plastic watch case, the watch case carrying a time display and a one piece watch strap, the watch case including strap retainer bars, the strap retainer bars being spaced from the ends of the watch case, the watch strap being positioned over one of the retainer bars and extending within a space between the one retainer bar and an end of the watch case and being positioned under the watch case and extending through a space between the other retainer bar and the other end of the watch case and extending over the other retainer bar, the retainer bars and the ends of the watch case being molded as an integral one piece unit, the watch strap including means for fastening the watch strap about a user's wrist, means mounting the fastening means to the watch strap, the fastening means being of a thickness greater than the space between the retainer bars and the ends of the watch case, each retainer bar including yieldable means for flexibly deflecting the retainer bar between the ends of the retainer bar to enlarge the space between the retainer bar and its watch case end to permit the watch strap with the fastening means to be inserted between the retainer bar and the end of the watch case.

4,639,145

DRAWER GUIDE

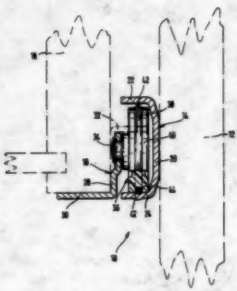
Horst Lautenschlager, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,715

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521860

Int. Cl.[4] F16C *19/00*; A47B *88/00*

U.S. Cl. 384—19 **2 Claims**



1. A guide for a drawable cabinet part, comprising: an elongated guide rail for fastening to a cabinet carcase, and having a front end and a rear end, and a flange; an elongated runner rail for fastening to a drawable cabinet part, and having a front end and a rear end, and also having a flange; said rails being displaceable relative to one another on first roller means rotatably mounted on the front end of the guide rail and rolling on the flange of the runner rail, and on second roller means rotatably mounted on the rear end of the runner rail and rolling on the flange of the guide rail; at least one circumferential groove in each roller surface of the roller means, a resilient tire inserted respectively into said roller means and protruding slightly above the rolling surface, end sections of the track flanges supported on the rolling surfaces of the respective roller means in fully retracted position of the tracks having a narrow indentation in alignment with the respective resilient tire and extending a short distance in the opening direction of the drawer, the depth of the indentation being at least equal to the radial elevation of the resilient tire above the rolling surface of the respective roller means.

4,639,146

THRUST BEARING

Masahiro Yoshioka, Ibaraki; Hideki Izumi, Tsuchiura; Hiroshi Inouye; Eiichi Hazaki, both of Ibaraki, and Shiro Nakadaira, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,324

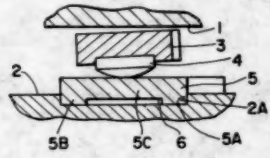
Claims priority, application Japan, Apr. 15, 1983, 58-65389

Int. Cl.[4] F16C *27/00, 27/08, 17/06*

U.S. Cl. 384—99 **5 Claims**

1. A thrust bearing of the type having a plurality of bearing pads, pivots being provided on a back side of said bearing pads, an annular carrier having supporting legs and a resilient portion between said supporting legs, a plurality of apertures

being provided in said resilient portion, and support means for said annular carrier, wherein a rear side of said resilient portion, said supporting legs and said support means define a squeeze film damper gap.

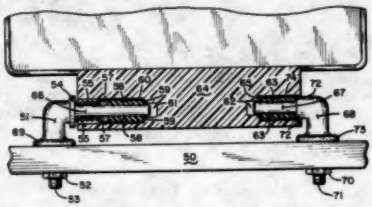


4,639,147

FRICTION PIVOT ASSEMBLY

Edward L. Schwarz, 2825 Brookwood Terr., Minneapolis, Minn. 55410

Filed Aug. 13, 1984, Ser. No. 639,802
Int. Cl.[4] E05C *17/64*; A47K *13/12*; B63H *25/00*; F16C *11/04*
U.S. Cl. 384—125 **23 Claims**



1. A rotational friction pivot comprising:

(a) a journal member having a hole within it of preselected diameter and length;

(b) a bracket including a cylindrical shaft having a first portion projecting at least a predetermined distance into the hole, and a second portion integral with the remainder of the bracket, said shaft and journal member being relatively rotatable with respect to each other and said shaft having a diameter within the hole establishing an annular clearance space between itself and the wall of the journal member hole;

(c) a tubular friction bushing having first and second ends and formed of a pliable material, and having undeformed outside and inside diameters substantially that of the journal hole diameter and the shaft diameter respectively, and occupying a portion of the annular clearance space, said first and second ends of the friction bushing being adjacent the first and second portions of the shaft respectively;

(d) first and second stop means each at least partially disposed about the shaft adjacent the first and second ends of the friction bushing, at least one of said stop means occupying a part of the annular clearance space and slidably shiftable toward the other stop means within the annular clearance space; and

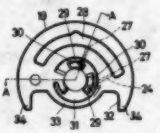
(e) compressing means operatively linked to the shiftable stop means for axially shifting said shiftable stop means relatively toward the other stop means and axially compressing the friction bushing within the annular clearance space, whereby the friction bushing radially expands against the journal member hole wall and the shaft surface adjacent to allow rotation with frictional slipping between the bushing and at least one of the journal member and the bracket.

4,639,148

THRUST BEARING FOR TURBOCHARGER

Toru Tamura, Obu; Noriyoshi Shibata, Nagoya, and Toshiro Kawakami, Obu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 1, 1985, Ser. No. 697,526
Claims priority, application Japan, Feb. 24, 1984, 59-024557[U]
Int. Cl.[4] F16C *17/04, 32/06, 33/10*
U.S. Cl. 384—420 **3 Claims**



1. A thrust bearing for sustaining the thrust load of the rotor shaft of a turbocharger, the thrust bearing having a first and second opposed side surface, comprising:

a first groove formed in said first side surface of the thrust bearing for holding lubricating oil supplied to the bearing;

at least one first oil passage extending from the groove toward the axis of the rotor shaft;

at least one second oil passage communicating with the first oil passage and having a plurality of oil holes connected thereto that extend respectively to a plurality of tapering land portions formed on said first and second side surfaces of said thrust bearing so that the axial thrust bearing clearance decreases in a direction of rotation of said shaft;

a first and second leg portion defining a cut out portion formed exclusively in the lower end portion of the thrust bearing;

a planar portion formed in the end surface of the thrust bearing along the first and second cut out portion and forming a portion of a closed loop; and

a second groove formed between the planar portion and said surfaces on which the shaft bears wherein the oil holes are formed in proximity to a point of maximum thrust clearance of said tapering land portions.

4,639,149

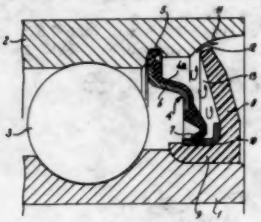
SEAL FOR A ROLLER BEARING

Johan Chr. M. Bras, Trichi, and Herman D. Lankamp, Odijk, both of Netherlands, assignors to SKF Industrial Trading & Development Company B. V., Netherlands

Filed Jul. 2, 1985, Ser. No. 751,288
Claims priority, application Netherlands, Jul. 13, 1984, 8402222
Int. Cl.[4] F16C *33/78*; F16J *15/40*
U.S. Cl. 384—477 **3 Claims**

1. A bearing assembly comprising inner and outer rings having spaced raceways for a plurality of rolling elements, seal means adjacent at least one axial end of the rings completely within the axial confines of the rings comprising a first sealing element including a sealing lip sealing the annular space between the rings and an annular shield of a rigid material secured to one of the race rings spaced axially outwardly of said first sealing element and having an outer edge spaced from an arcuate wall of the other race ring to define a slot-shaped opening adjacent the ring opposite the ring engaged by the sealing lip to form between the first sealing element and said shield a chamber connected via the slot-shaped opening to the

environment of the bearing whereby upon relative rotation of the rings a current is created in said chamber directed away



from the sealing lip to prevent penetration of the sealing lip by moisture and foreign matter in said chamber.

4,639,150

INTERMEDIATE BEARING FOR THE PROPELLER SHAFT OF A MOTOR VEHICLE

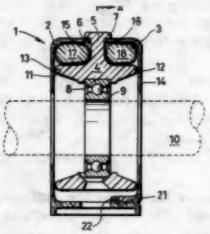
Heinz P. Habermann, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 25, 1986, Ser. No. 843,891

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511480

Int. Cl.⁴ F16C *27/06*

U.S. Cl. 384—536 **9 Claims**



1. An intermediate bearing for the propeller shaft of a motor vehicle comprising:

a rigid casing constituted by two parts which form an annular casing having a generally U-shaped cross section;

a resilient deformation member contained in said casing and having on its inner periphery a receiving means for a bearing for said propeller shaft and further comprising radially outwardly extending webs which lie in the radial median plane of the bearing and are engaged with apertures formed in said rigid casing.

4,639,151

ELECTRONIC TYPEWRITER WHICH PRINTS SELECTED PORTIONS OF A TEXT

Hideo Ueno; Hiroshi Kuno, and Yoshifumi Hamabe, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 9, 1984, Ser. No. 670,021

Claims priority, application Japan, Nov. 18, 1983, 58-218409

Int. Cl.⁴ B41J *5/30*

U.S. Cl. 400—63 **5 Claims**

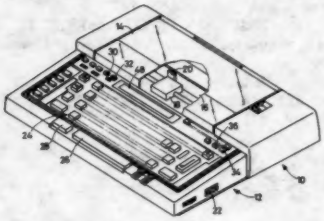
1. An electronic typewriter with data storing and editing capability, comprising:

keyboard means, having character keys and function keys, for entering printing data including character data representative of a text, said keyboard means having at least one cursor key;

text memory means for storing said printing data entered through said keyboard means;

printing assembly means operated according to the printing data stored in the text memory means, for printing said text;

display means for displaying at least a portion of a line of characters represented by one of plural groups of the character data which represents corresponding plural lines of characters constituting said text, said display means effecting a vertical scrolling operation by simultaneous activation of one of said function keys and one of said at least one cursor key, to select said one of plural groups of the character data, and thereby displaying the corresponding line of characters, said display means including means responsive to the simultaneous activation



of said one function key and said one cursor key for establishing an edit mode in which said corresponding line of characters displayed on said display means may be edited;

first printing control means, operative in an entire-text printing mode, for controlling the operation of the typewriter so as to cause said printing assembly means to print all lines of characters of said text stored in said text memory means;

second printing control means, operative in a single-line printing mode, for controlling the operation of the typewriter so as to cause said printing assembly means to print only said corresponding line of characters; and

third printing control means, operative in a partial-printing mode and in said edit mode, for controlling the operation of the typewriter so as to cause said printing assembly means to print said corresponding line of characters displayed on said display means, and all of the remaining lines of said text following the displayed lines.

4,639,152

PRINTING APPARATUS WITH A THERMAL PRINT HEAD

Takemi Yamamoto, and Yasutaka Tomida, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 14, 1984, Ser. No. 681,584

Claims priority, application Japan, Dec. 20, 1983, 58-240612; Dec. 20, 1983, 58-240613

Int. Cl.⁴ B41J *3/20*; H05B *3/00*; G01D *15/10*

U.S. Cl. 400—120 **10 Claims**

1. A printing apparatus for printing on a sheet of paper via a thermal ribbon having a thermally transferable ink layer, comprising:

a paper feeding device for feeding the sheet of paper;

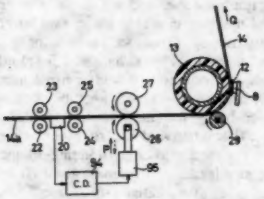
a thermal print head including heat generating elements which are held in pressed contact with the surface of said sheet of paper via said thermal ribbon, said heat generating elements being selectively energized to apply heat to said ink layer of the thermal ribbon to fuse the ink for adherence of the fused ink to the surface of the paper;

a first pair of rollers disposed on opposite sides of a path along which said sheet of paper is fed toward said thermal

print head, and a second pair of rollers disposed on opposite sides of said path, said first and second pairs of rollers applying a tension to a portion of said sheet of paper between the first and second pairs of rollers;

a detecting device disposed between said first and second pairs of rollers in the direction of feed of said sheet of paper for sensing the surface smoothness of said sheet of paper fed by said paper feeding device;

a print-quality improving device for improving the quality of printing on said sheet of paper, said print-quality improving device being disposed downstream of said detecting device in said direction of feed of said sheet of paper; and



a control device connected to said detecting and print-quality improving devices and activating said print-quality improving device while said surface smoothness sensed by said detecting device is lower than a preset lower limit, said control device deactivating said print-quality improving device while the sensed surface smoothness is not lower than said preset lower limit.

4,639,153

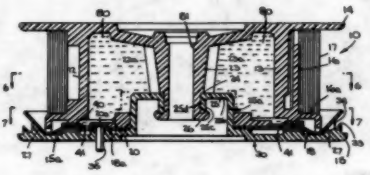
PRINTING RIBBON SPOOL HAVING AN INK RESERVOIR AND METHOD OF MAKING SAME

Wei-Tsang Cheng, Waterbury, Conn., assignor to Jing Tech, Inc., Bethany, Conn.

Filed Jul. 9, 1984, Ser. No. 628,762

Int. Cl.⁴ B41J *31/14*

U.S. Cl. 400—202.1 **5 Claims**



1. A printing ribbon spool comprising:

a spool body, at least a portion of an ink reservoir in said spool body, said spool body having spaced flange portions extending outwardly, said spool body having a surface to receive a ribbon wound thereon between said spaced flange portions to define a zone of ribbon wrap, the ribbon advancing toward and from said zone of ribbon wrap when said spool is wound and unwound, respectively;

ink-delivery means for said spool comprising an ink-delivery pad near one of said flange portions, said ink-delivery pad having an exposed portion in the path of the advancing ribbon to contact a portion of the ribbon as the ribbon advances therepast, said ink-delivery pad communicating in ink-receiving relation with said ink reservoir to receive ink from said ink reservoir when said spool is in an operating position and to convey the ink to said exposed portion of said ink-delivery pad;

said spool including ink-impervious means forming a portion of said ink reservoir disposed between said ink-delivery pad and ink in said ink reservoir to isolate said ink-delivery pad from ink in said ink reservoir, said ink-impervious means having at least one breakable portion and said spool including means for breaking said portion to form an opening in said ink-impervious means to permit ink to pass therethrough from said ink reservoir to said ink-delivery pad.

4,639,154

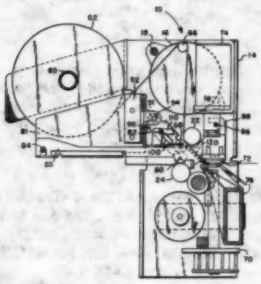
DUAL STATION PRINTER MECHANISM

Charles M. Myers, Riverton, Wyo., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 7, 1985, Ser. No. 742,331

Int. Cl.⁴ B41J *15/22*

U.S. Cl. 400—584 **4 Claims**



1. A dual station printer mechanism comprising a driven first feed roller having a first pressure roller biased thereagainst for feeding a first data carrier therebetween to a position between a print bar and a printhead at which said data carrier can be printed, a driven second feed roller having a second pressure roller biased thereagainst for feeding a second data carrier therebetween to a position between a print bar and a printhead at which said second data carrier can be printed, and a singular elongate crank arm mounted for rotation by an operator and having spaced-apart first and second cam portions therealong, said first and second pressure rollers rotatably mounted on respective mountings adapted such that rotation of the crank arm causes said first cam portion to press against said first pressure roller mounting and move said first pressure roller away from said first feed roller a distance sufficient to remove or insert said first data carrier therebetween and causes said second cam portion to press against said second pressure roller mounting and move said second pressure roller away from said second feed roller a distance sufficient to remove or insert said second data carrier therebetween and said crank arm including means operative upon rotation thereof to move the print bar away from the print head a distance sufficient to enable insertion or removal of the first and second data carriers from therebetween.

4,639,155

MELT DISPENSERS

Heinz Schuster, Oberursel, and Gerd Press, Kelkheim/TS, both of Fed. Rep. of Germany, assignors to USM Corporation, Flemington, N.J.

PCT No. PCT/GB84/00438, § 371 Date Aug. 2, 1985, § 102(e) Date Aug. 2, 1985, PCT Pub. No. WO85/02793, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 18, 1984, Ser. No. 767,275

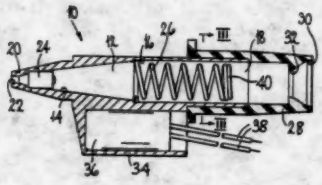
Claims priority, application United Kingdom, Dec. 22, 1983, 8334298; Oct. 26, 1984, 8427170

Int. Cl.⁴ B67D *5/32*

U.S. Cl. 401—1 **16 Claims**

1. In a device for melting and dispensing thermoplastic material supplied in the form of a rod, said device comprising means for application of a feeding force on the rod to urge it in

a direction towards a melt body and a melt body having an inlet adapted to receive a rod of thermoplastic material, an outlet, a passage extending between the inlet and outlet, and means for heating the melt body so that material which enters the passage via the inlet in the form of a rod may be dispersed from the outlet in a molten condition;



wherein the improvement comprises resilient means located within the passage and arranged to exert sufficient force in a reverse direction to move the rod outwardly of the melt body when the feeding force is not applied.

4,639,156

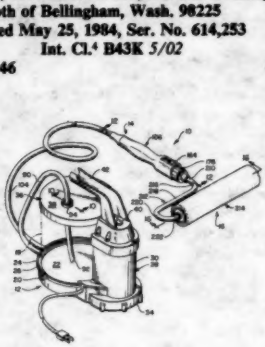
PAINTING APPARATUS AND METHOD

Donald J. Stern, 127 Underhill Rd., and Jon I. Allsop, 2317 N. Shore Rd., both of Bellingham, Wash. 98225

Filed May 25, 1984, Ser. No. 614,253

Int. Cl.[4] B43K *5/02*

U.S. Cl. 401—146 **48 Claims**



1. A painting system, comprising:

a. a supply section comprising a pump adapted to pump liquid paint from a paint source;

b. an applicator section comprising an applicator to dispense the paint from the applicator;

c. a delivery and control section comprising:

1. a delivery tube having a receiving end to receive the paint from the pump, a delivery passageway to carry the paint, and a discharge end to deliver paint to the applicator;

2. an actuating tube having an interior passageway distinct from said delivery passageway to contain air, said tube having a first end proximate to the supply section and a second end proximate to the applicator section;

3. a pressure responsive pump switch operatively connected to the actuating tube and to the pump to cause the pump to operate, said switch having an on position and an off position, said switch defining an air pressure chamber which, when pressurized to a first higher pressure level, holds said switch in said on-position, and when at a second lower pressure level, enables said switch to move to said off-position;

4. a pressurizing switch proximate to the applicator section and operatively connected to the second end of the actuating tube, said pressurizing switch having a release position where air pressure in the actuating tube is decreased to said lower pressure level to move the pump switch to its off position to inactivate the pump and interrupt delivery of paint, and a pressurizing position to raise pressure in said air pressure chamber so as to move the pump switch to its on position to activate the pump and to maintain said pressure at said higher pressure level so as to hold said pump switch in said on-position to cause delivery of the paint, said pressurizing switch comprising a switch housing, compressible tube means mounted in said switch housing and having a lengthwise axis, a first end, opening to ambient atmosphere, and a second end, opening to the second end of the actuating tube, and a manually operable pressure control member movable along said lengthwise axis on an actuating path from said release position where said control member is proximate said first end, to said pressurizing position where said control member is proximate said second end of the tube means, said control member being mounted to said switch housing in a manner that when said control member moves from said release position, said control member squeezes said tube means at a location proximate the first end of the tube means at an intermediate squeeze-off position to close said tube means to ambient atmosphere, and as said control member moves from said intermediate squeeze-off position to said pressurizing position, said control member squeezes said tube means along said lengthwise axis to pressurize the air pressure chamber of the pump switch to said higher level.

4,639,157

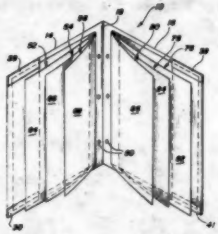
SECTIONALIZED FOLDER

Jason H. Herzfeld, 713 Double Tree La., Long Beach, Calif. 90815

Filed Aug. 22, 1985, Ser. No. 768,197

Int. Cl.[4] B42F *11/00, 7/06*; B42D *3/06*

U.S. Cl. 402—19 **12 Claims**



1. A folder comprising:

a front cover sheet;

a back cover sheet hingedly connected to said front cover sheet at inner lateral edge portions thereof;

a front flap covering an outer lateral portion of an inner face of said front cover, said front flap secured at its outer lateral edge to the outer lateral edge of said front cover and secured with a suitable adhesive at its upper and lower edges to upper and lower edges respectiely of said front cover to form a pocket at an outer lateral portion of said inner face;

a back flap covering an outer lateral portion of an inner face of said back cover, said back flap secured at its outer lateral edge to the outer lateral edge of said front cover and secured with a suitable adhesive at its upper and lower edges to upper and lower edges respectively of said back cover to form a pocket at an outer lateral portion of said inner face of said back cover;

a plurality of inner front sheets superimposed over said inner face of said front cover, said plurality of inner front sheets folded outwardly over themselves along a longitudinal line of each of said plurality of said inner front sheets, said longitudinal line of each of said plurality of sheets being

superimposed over the longitudinal line of each successively lower sheet of said plurality of sheets;

a plurality of inner back sheets superimposed over said inner face of said back cover, said plurality of inner back sheets folded outwardly over themselves along a longitudinal line of each of said plurality of said inner back sheets, said longitudinal line of each of said plurality of sheets being superimposed over the longitudinal line of each successively lower sheet of said plurality of sheets.

4,639,158

FLUID PRESSURIZED JOINT ASSEMBLY

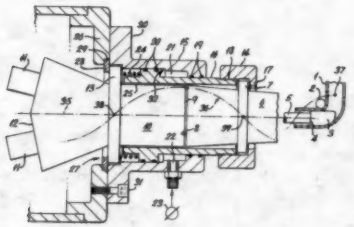
Gerald M. Jones, Trimpley, England, assignor to National Research Development Corp., London, England

Filed Jul. 2, 1984, Ser. No. 627,295

Claims priority, application United Kingdom, Jul. 8, 1983, 8318576

Int. Cl.⁴ F16D *1/10*; F16B *7/00*

U.S. Cl. 403—31 **2 Claims**



1. A joint assembly comprising a first and vibratable component and a second component to which vibration is to be transmitted, said first and second components having a common axis of alignment, each of said first and second components being of male form and having a peripheral flange and means for urging said first and second components towards and into firm and direct contact with each other in a direction parallel to said common axis and comprising:

a first joint member separate from but engageable in a direction parallel to said common axis with one of said components;

a second joint member separate from but engageable in a direction parallel to said common axis with the other of said components;

each of said first and second joint members being of female form and including a groove adapted to engage with said flange of a corresponding component, each flange received in a respective groove of said first and second joint members, and there being an annular space between at least one of said first and second male components and at least one of said first and second joint members;

intermediate means being sleeve-like in form and separate from said first and second components and which is fixed to one of said joint members and movable within said annular space for making a flexible sealed contact with the other of said joint members, to completely define a sealed chamber of variable capacity with said other of said joint members; and

means disposed on one of said first and second joint members for connnecting said chamber to a source of pressurized fluid, whereby a force is created when said chamber is pressurized, such force causing the joint members to engage with the respective components to cause relative sliding between said intermediate means and said other of said joint members, and thus to urge said first and second components toward one another into said firm and direct contact.

4,639,159

DEVICE FOR ATTACHING BELLOWS TO A CYLINDRICAL MEMBER

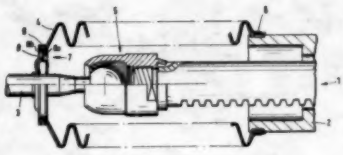
Hans Amrath, Viersen, Fed. Rep. of Germany, assignor to TRW Ehrenreich GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,837

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307929

Int. Cl.⁴ F16J *15/52*; F16L *51/02*

U.S. Cl. 403—50 **14 Claims**



1. A device for attaching a bellows to a cylindrical member, comprising:

an annular disc arranged between an end of said bellows and said cylindrical member,

means for connecting said annular disc to said bellows,

the disc having a closed outer edge and an inner edge which is interrupted by substantially radially extending slots in the disc, and

said disc forming between said slots a plurality of resilient segments, and

said segments are bent alternately in opposite directions and spring biasingly engage against said cylindrical member.

4,639,160

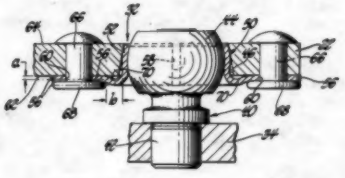
WINDSHIELD WIPER BALL JOINT

Edward H. Huesman, West Carrollton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1986, Ser. No. 819,929

Int. Cl.⁴ F16B *9/00*; F16C *11/00*

U.S. Cl. 403—71 **2 Claims**



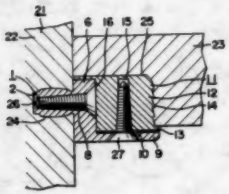
1. A universal joint for linkage apparatus including a pair of link members, comprising, means defining in one of said members a hole smoothly varying in diameter from a largest diameter adjacent one surface of such one member diameter to a least diameter adjacent the opposite surface thereof, a ball stud on the other of said members received in said hole, a socket member including a part-spherical socket portion engaged in said hole over said ball stud and slotted so as to be squeezable to decreasing diameters upon movement thereof in a direction axially of said hole toward said opposite surface, said socket member further including integral resilient attachment portions adapted for juxtaposition to said one surface, and attachment means resiliently stressing said attachment portions in secured and deformed relation to said one member about their juncture with said socket portion in a manner whereby said socket portion is urged axially of said hole toward said opposite surface.

4,639,161

SHELVING DEVICE

Yoshiyuki Mazaki, Kokubunji, Japan, assignor to Kabushiki Kaisha Murakoshi Seiko, Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 793,853
Int. Cl.[4] F16B *13/10*
U.S. Cl. 403—245 3 Claims



1. A device for so securing a shelf to an upright member as to dispose an end of the shelf closely adjacent to a side of the upright member, of the type comprising an insert element for attachment to the upright member and an engagement element for attachment to the shelf and for connection with the insert element, said device being characterized by:

A. said insert element having

(1) a horizontally elongated buried portion which has inner and outer ends and which is receivable in a hole in the upright member that opens to said side thereof, and

(2) a receiving portion on the outer end of said buried portion, having

(a) a flat vertical surface which is transverse to the length of said buried portion and which faces towards said inner end thereof to flatwise engage said side of the upright member,

(b) a support plate portion that projects from said flat surface in the direction away from said inner end and which has a horizontal top surface, and

(c) a pair of opposite oblique side surfaces

(i) which extend at such opposite upward inclinations in relation to said horizontal surface as to be in upwardly convergent relation to one another and

(ii) which are at such opposite inclinations to said flat surface as to diverge from one another in said direction;

B. said engagement element being closely receivable in a cavity in the shelf that opens to its bottom and to its said end and having

(1) a flat side surface which is flush with said end of the shelf when the engagement element is received in said cavity,

(2) a bottom surface opposable to said horizontal top surface of the support plate portion of the insert element,

(3) a pocket which opens to said bottom surface and to said flat side surface and which has a pair of opposing oblique inner surfaces that matingly engage said oblique side surfaces on the receiving portion of the insert element and cooperate with them as the engagement element is slid down relative to the insert element to wedgingly drive said flat side surface of the engagement element firmly against said side of the upright member, and

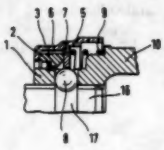
(4) a hole opening to said bottom surface which aligns with a hole through said support plate portion of the insert element and in which a screw is receivable to draw the engagement element downward relative to the insert element and releasably secure those elements to one another.

4,639,162

DRAWING LOCK FOR TORQUE TRANSMITTING ENGAGEMENT BETWEEN TWO SHAFT MEMBERS ARRESTABLE IN THE OPEN POSITION

Hubert Geisthoff; Theo Buthe, both of Lohmar, and Felix Mikeska, Siegburg, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar/Rhld. 1, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 836,096
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511576; Oct. 31, 1985, 3538708
Int. Cl.[4] F16B *7/00*
U.S. Cl. 403—316 10 Claims



1. A drawing lock capable of being arrested in an open position for connecting two shafts, particularly a power take-off shaft of a tractor and a drive shaft of an agricultural implement comprising

a coupling sleeve defining a bore adapted to receive a shaft, said shaft being inserted into said bore from a slipping-on direction and being in torque transmitting engagement with said coupling sleeve;

a plurality of radial apertures in said coupling sleeve and blocking members received in said apertures to be radially movable therein, said blocking members being adapted to engage within an annular groove within said shaft received in said bore;

a locking ring engaging said blocking members to hold them in engagement within said annular groove in said shaft;

spring means exerting a spring force on said locking ring;

gripping sleeve connected to said locking ring for enabling axial movement thereof, said gripping sleeve being shaped to define a free space on the side of said locking ring toward said slipping-on direction;

a slotted spring ring provided in said free space;

a supporting ring axially affixed to said coupling sleeve defining a supporting face located for engagement with said spring ring;

said slotted spring ring being configured with a stepped configuration on a side thereof facing toward said slipping-on direction defining a first axially acting stop face and a second axially acting stop face, said second stop face being axially spaced from said first stop face and being located radially inwardly thereof; and

a continuous bead formed on said slotted spring ring adjacent said second stop face adapted for engaging with said blocking members;

said slotted spring ring being locked in a position with said continuous bead in engagement with said blocking members by engagement of said first stop face with said supporting face and being expanded radially by outward movement of said blocking members to enable a shaft to be inserted in torque transmitting engagement into said bore of said coupling sleeve, said radial expansion of said spring ring causing said first stop face to become disengaged from said supporting face and said second stop face to be brought into engagement therewith.

4,639,163
DRIVELINE COUPLING WITH SAFETY INTERLOCK MECHANISM

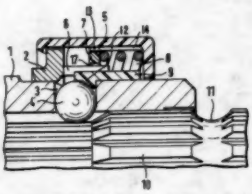
Theo Buthe; Hubert Geisthoff, both of Lohmar; Horst Kretschmer, Cologne; Felix Mikeska, Siegburg, and Alexander Post, Neunkirchen, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 678,638

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345732

Int. Cl.⁴ F16B *7/00*

U.S. Cl. 403—322 **12 Claims**



1. A driveline coupling mechanism with a safety interlock device particularly suitable for connecting the drive shaft of an agricultural implement with the power takeoff shaft of a tractor, comprising:

a coupling sleeve having radial apertures therein;

a drive shaft configured to enable it to be held in torque transmitting engagement with said coupling sleeve having an annular groove formed therein;

engagement members located within said radial apertures and radially movable therein for engagement within said annular groove to axially hold said coupling and said shaft together;

a locking ring member axially movable on said coupling sleeve between a locking position, for locking said engagement members in engagement within said annular groove and an unlocking position, permitting said engagement members to move radially upwardly for disengagement from said annular groove;

spring means axially biasing said locking ring member toward said locking position;

latching means engaging within said radial apertures in a latched position and structured to abut said locking ring member for holding said locking ring member in said unlocking position, said latching means being engaged by said engagement members and being brought to an unlatched position to permit said locking ring member to move to said locking position when said drive shaft is inserted into said coupling sleeve;

a guide ring affixed to said coupling sleeve; and

guide means interposed between said guide ring and said locking ring member for enabling relative axial movement between said locking ring member and said coupling sleeve while preventing relative rotative movement therebetween when said locking ring means is in said unlocking position.

4,639,164
UNDERGROUND TANK SUMP AND PIPING SYSTEM

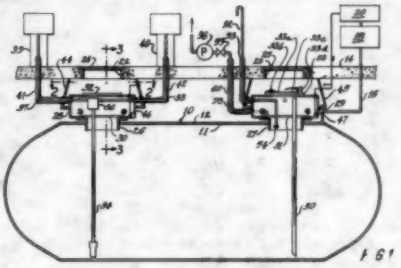
Peter J. Pugnale, The Woodlands, Tex., and Michael J. Messmer, Toledo, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 6, 1985, Ser. No. 730,961

Int. Cl.⁴ B65D *25/24*

U.S. Cl. 405—54 **1 Claim**

1. An underground storage tank and a sump and piping assembly therefor comprising an elongate, generally cylindrical tank installed underground with a longitudinal axis thereof extending generally horizontally, a manway fitting in an upper wall portion of the tank, the manway fitting including a tubular portion in communication with the inside of the tank and an upper external flange, a cylindrical sump mounted underground on the flange of the manway fitting in upwardly spaced relationship to the upper wall portion of the tank and including a bottom wall and a cylindrical sidewall, and piping in communication with the inside of the tank through the bottom wall of the sump, there being no communication between the sump



and the inside of the tank except through said piping, said piping also communicating with an above-ground dispenser through the sidewall of the sump, an underground portion of the piping leading to the dispenser from the sump being provided with a double wall including an inner wall and an outer wall, and said outer wall restraining any liquid leaked from said inner wall from contaminating the environment by conducting the leaked liquid through the sidewall to the inside of the sump.

4,639,165
DRAINAGE TUBE

Anthony E. Flecknoe-Brown, Melbourne, Australia, assignor to A.A.R.C. (Management) Pty. Limited, Victoria, Australia

Continuation-in-part of Ser. No. 419,752, Sep. 20, 1982, abandoned. This application Feb. 22, 1985, Ser. No. 704,575

Int. Cl.⁴ E02B *11/00*

U.S. Cl. 405—45 **11 Claims**

1. An essentially continuous subsoil sheet drainage element comprising:

a core sheet of generally planar configuration having on at least one side of a plane regularly spaced, hollow, equal depth supporting projections each having a base and a flat top, said plane located at the base of each projection; and

a covering of geotextile filter cloth surrounding said core;

the depth of projections on one side of said plane and the spacing between adjacent projections permits the core sheet to be tightly folded upon itself without damage or significant loss of water carrying capacity.

4,639,166
CONSTRUCTION OF JACKETS

Derek T. Fern, Watford, United Kingdom, assignor to PMB Systems Engineering Limited, London, England

Filed Apr. 17, 1985, Ser. No. 724,123

Claims priority, application United Kingdom, Mar. 22, 1985, 8507553

Int. Cl.⁴ E02D *21/00, 25/00*

U.S. Cl. 405—203 **22 Claims**

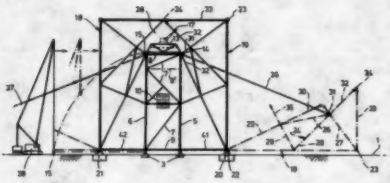
1. A method of constructing an elongate jacket for erection in water as a supporting structure wherein said jacket is constructed with its axis of elongation lying generally horizontally, comprising the steps of

forming elongate central trusses, said central trusses having elongate edges generally parallel to said axis of said jacket;

raising said central trusses into upright and mutually opposed positions resting on their respective elongate edges, and bracing said central trusses together to form a strong

and coherent internal structure extending lengthwise of the jacket and having a base, upright sides and an upper surface;

prefabricating substantially horizontally at least one side truss having outer and inner elongate edges, said inner elongate edge extending alongside and outwardly laterally spaced from a corresponding side of said internal structure;



supporting said inner elongate edge of said side truss;

applying tensile force between said internal structure at positions spaced from its base

and said side truss at positions spaced from said inner elongate edge, thereby to rotate said side truss into an upright position resting on said inner elongate edge; and

bracing said side truss thus rolled up at least to said internal structure.

4,639,167

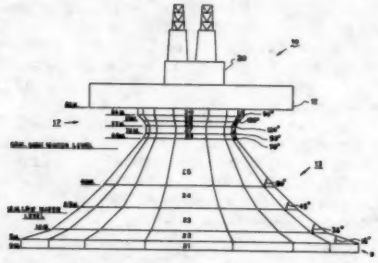
DEEP WATER MOBILE SUBMERSIBLE ARCTIC STRUCTURE

Terry D. Petty; Carmon R. Costello, both of Kenner; Kun K. Song, New Orleans; Luc G. Chabot, La Place, all of La.; Tadahiro Fujita, Kanagawa, Japan; Haruki Hirose, Kanagawa, Japan, and Nobutoshi Yoshimura, Mie, Japan, assignors to Odeco, Inc., New Orleans, La. and Nippon Kokan, K.K., Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,635

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—217 **7 Claims**



1. A mobile marine drilling structure of the submersible bottom-founded type for operation in arctic waters, said structure including a base for placing the structure on the sea bed, a hull extending from the base, and a deck supported by the hull and located at a safe elevation above the water line for conducting drilling operations and having sufficient deck space to accommodate drilling equipment and supplies, said hull having an internal frame assembly including external wall sections at different inclinations to the horizontal to engage and break up the moving ice masses encroaching on the hull, the improvement wherein

said external wall sections include a plurality of matching polygonal, frusto-pyramidal, apex-up walls extending above the base at increasing angles to the horizontal from about 12° to 75°; a matching polygonal, substantially cylindrical, first transitional wall extending substantially vertically above the apex-up walls; at least one matching polygonal, frusto-pyramidal, apex-down wall extending above the cylindrical wall at an angle to the horizontal from 95° to 150°; and a matching polygonal,

second transitional wall extending above the apex down wall at an obtuse angle to the horizontal from 90° to 140°, and said obtuse angle being less than the angle of said apex-down wall.

4,639,168

HOLLOW FOUNDATION BODY AND METHOD OF MAKING A FOUNDATION

Bernhard Wietek, A-6073, Sistrans No. 290, Austria

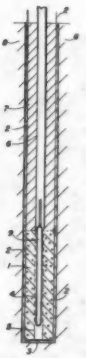
PCT No. PCT/AT83/00001, § 371 Date Jan. 13, 1984, § 102(e) Date Jan. 13, 1984, PCT Pub. No. WO83/04276, PCT Pub. Date Dec. 8, 1983

PCT Filed Jan. 7, 1983, Ser. No. 576,384

Claims priority, application Austria, May 24, 1982, 2031/82

Int. Cl.[4] E02D *3/10, 5/38*

U.S. Cl. 405—239 **6 Claims**



1. A method of constructing a foundation body for reducing a ground water level comprising:

positioning a vertically elongated pile in an opening in the ground bearing the ground water level, the pile being vertically elongated and having a vertical opening extending therethrough;

providing said pile to include an upper load bearing part of water impervious material and a lower load bearing layer of water pervious material made of filtering concrete with a pipe which is water pervious at least in the area of said lower layer extending in a portion of said opening in said lower layer;

pumping out ground water through said pipe and said opening which has entered said opening through said lower layer; and

adding water impervious material to said lower layer through said opening to render said lower layer water impervious.

4,639,169

MINERAL MINING INSTALLATION

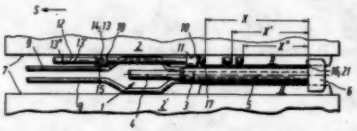
Kunibert Becker, Werl; Rüdiger Kirchbrücher, Dortmund-Brackel, and Michael Preuschoff, Lüdinghausen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,559

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403906

Int. Cl.[4] E21D *15/44*

U.S. Cl. 405—291 11 Claims



1. A mineral mining installation comprising a roof support unit and an advance mechanism, said roof support unit having a floor sill constituted by at least one floor girder, said advance mechanism comprising a hydraulic advance ram, said advance ram having a relatively-displaceable cylinder and a piston rod, and a device for selectively limiting the working stroke of the ram, the improvement wherein said stroke-limiting device comprises a stop fixed to a movable part of the advance ram, and an adjustable stop member mounted on a roof support unit floor girder, said adjustable stop member comprising a rod, means for fixing said rod to said floor girder in any one of a plurality of positions, and wherein, said rod fixing means comprises at least one bracket fixed to said floor girder, and a passage in said at least one bracket slidably mounting said rod and means for locking said rod at a longitudinally adjustable position relative to said at least one bracket.

4,639,170

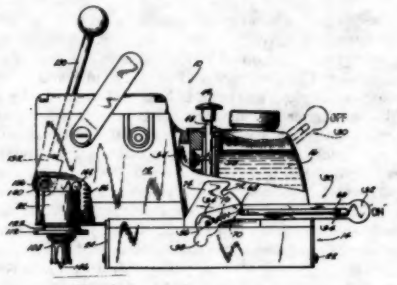
MAGNETIC BASE FOR PORTABLE TOOLS

Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Milwaukee, Wis.

Filed Apr. 8, 1985, Ser. No. 720,899

Int. Cl.[4] B23B *45/14*

U.S. Cl. 408—76 8 Claims



1. An electric power tool having a base,

permanent magnet means in said base for holding said base to a ferromagnetic material,

means operative to substantially shunt the magnetic field of said permanent magnet means to permit removal of the tool from the material,

a handle including lever means movable between "on" and "off" positions and connected to said shunt means to cause said shunt means to become operative when the lever means is moved to said "off" position,

a probe mounted in said base for reciprocation between a retracted position and a second position in which it projects from said base,

a spring biasing said probe to its said second position,

and means interconnecting said probe and said shunt means to prevent movement of said shunt means when said probe is in said second position.

4,639,171

DOWEL HOLE DRILLING MACHINE

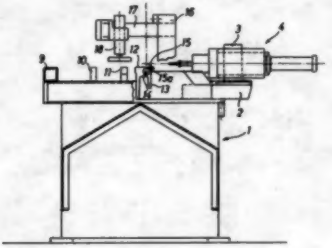
Johann Maier, Wolfratshausen, Fed. Rep. of Germany, assignor to Schleicher Maschinenbau und -Vertrieb GmbH, Geretsried, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,497

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 8407334

Int. Cl.[4] B23B *41/00*

U.S. Cl. 408—89 6 Claims



1. A dowel hole drilling machine, comprising a work support having a first portion and a second portion; a crosspiece, the second portion of said support being provided on said crosspiece; means for pivotally connecting said crosspiece and the second portion of said support to the first portion of said support so that the crosspiece and the second portion of said support are pivotable about a predetermined axis between first and second postions at right angles to each other; at least one drilling unit mounted on and pivotable with said crosspiece between said first and second positions; and first and second stops provided on said crosspiece, a workpiece resting on the first portion of said support being arranged to simultaneously rest on the second portion of said support as well as to abut against one of said stops in one position of said crosspiece, and a workpiece resting on the first portion of said support being arranged to abut against the second portion of said support as well as to abut against the other of said stops in the other position of said crosspiece.

4,639,172

TRACE CONTROL METHOD

Hajimu Kishi; Mitsuo Matsui, and Hitoshi Matsuura, all of Tokyo, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP84/00056, § 371 Date Jan. 25, 1985, § 102(e) Date Jan. 25, 1985, PCT Pub. No. WO84/04718, PCT Pub. Date Dec. 6, 1984

PCT Filed Feb. 20, 1984, Ser. No. 700,703

Claims priority, application Japan, May 31, 1983, 58-096289

Int. Cl.[4] B23Q *35/121;* G05B *19/24*

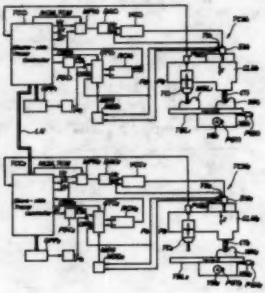
U.S. Cl. 409—80 12 Claims

1. A method for operating a master-slave type tracer system, comprising

machining a workpiece according to a model by tracing said model with a master unit of said system, said master unit including a tracer head for tracing a model and cutting means for cutting said workpiece, wherein said tracer means and cutting means are moved together on a movable element by respective motors of said master unit along respective axes for said tracing and machining, and

said master unit calculates velocity commands in digital form to drive said respective motors along said respective axes of said master unit, to provide said machining according to displacement signals corresponding to said respective axes from said tracing of said model by said tracer head, and

simultaneously machining a further workpiece, with a slave unit of said system which includes a respective cutter means driven along respective axes by respective motors of said slave unit, for machining said further workpiece in correspondence to said tracing by said master unit of said model according to a move command supplied from said master unit, for each of said respective axes of said slave unit in correspondance to said axes of said master unit during each of a succession of intervals,



wherein each said move command is provided from said master unit to said unit as digital numerical data, as a result of said master unit monitoring data corresponding to the current position along each respective axis of the movable element thereof on which said tracer head is mounted, and said slave unit calculates, on the basis of each said mode command from said master unit, a respective number of pulses corresponding to the movement to be provided along each respective axis of said slave unit during each said period, and produces each said number of calculated pulses during each respective period,

wherein said machining by said slave unit is provided by movement of the respective cutter means along each respective axis of said slave unit according to the pulses for each said axis for each said period.

4,639,173

APPARATUS FOR PRODUCING A CAM WITH SINUSOIDAL CAM LOBE SURFACES

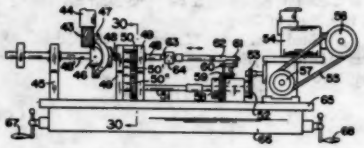
Francis E. Waller, Dover, Fla., assignor to Leonard J. E. Waller; Wm. J. Gdovin and Walter J. Monacelli, part interest to each

Continuation-in-part of Ser. No. 582,263, Feb. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 420,390, Sep. 20, 1982, abandoned, which is a division of Ser. No. 320,213, Nov. 12, 1981, Pat. No. 4,432,310, which is a continuation of Ser. No. 265,259, May 19, 1981, abandoned, which is a continuation of Ser. No. 35,553, May 3, 1979, abandoned. This application Aug. 1, 1985, Ser. No. 761,487

Int. Cl.[4] B23C *3/08*

U.S. Cl. 409—122 **4 Claims**

1. Apparatus for producing a cam having sinusoidal cam lobe surfaces, which comprises (1) a first supporting means for rotatably supporting a cylinder workpiece; (2) a first rotating means for rotating said cylinder at a controlled rate about its cylindrical axis; (3) a second supporting means for supporting a cutting or grinding tool, (4) a rotating means for rotating said tool; (5) an advancing and retracting means for advancing and retracting said cylinder supporting means, said advancing and retracting means being adapted to position a flat end of said cylinder adjacent to and in cutting or grinding relationship with the side of said cutting or grinding tool; (6) a third supporting means for supporting said advancing and retracting



means; and (7) a moving means for moving said third supporting means incrementally toward said tool.

4,639,174

SELF-PLUGGING BLIND RIVET

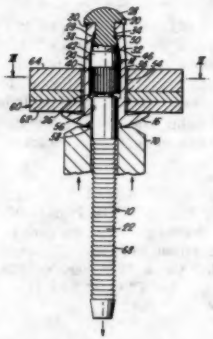
Keith Denham, and Stephen Archer, both of Welwyn, England, assignors to Avdel Limited, Welwyn Garden City, England

Filed Nov. 9, 1984, Ser. No. 669,867

Claims priority, application United Kingdom, Nov. 17, 1983, 8330688

Int. Cl.[4] F16B *13/04*

U.S. Cl. 411—34 **12 Claims**



1. A self-plugging blind rivet comprising an elongate stem and a tubular rivet body, the body having an elongate shank, a radial enlargement providing a rivet head at one end of the shank, a tail-end at the other end of the shank, and a bore extending axially through the rivet head and shank to the tail end, the stem extending through the bore of the body and comprising a stem-tail which projects from the head end of the body, and a plug connected to the stem-tail, the plug having a generally cylindrical first part adjacent to the stem-tail, a second part which is spaced from the stem-tail by the first part, and a radially enlarged terminal head at the end of the stem remote from the stem-tail, wherein the second part has a maximum diameter not greater than the diameter of the cylindrical first part, and the diameter of the plug is reduced progressively in the second part in the direction towards the terminal head, the second part having an initial reduction in diameter adjacent to the cylindrical first part, and an abrupt further reduction in diameter at a position spaced from the first part and from the underhead surface, said abrupt further reduction providing an abutment which faces towards the terminal head and an annular groove between the said abutment and the underhead surface, the terminal head presenting an underhead surface which faces towards the stem-tail for abutting the tail-end of the shank, the shank of the body having a main portion adjacent to the rivet head and an end portion spaced from the rivet head by the main portion, wherein the external and internal diameters of the end portion of the shank reduce progressively in the

direction towards the tail-end over an axial length greater than the width of the annular groove, and the end portion has a radially inwardly extending part adjacent the tail-end of the shank, which part extends into the annular groove.

4,639,175

SELF-SEALING EXPANSION RIVET ASSEMBLY

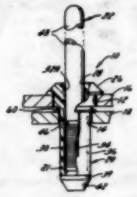
Burnell J. Wollar, Barrington, Ill., assignor to Phillips Plastics Corp., Chippewa Falls, Wis.

Filed May 15, 1984, Ser. No. 610,521

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.[4] F16B *13/04*

U.S. Cl. 411—38 4 Claims



1. A self-sealing expansion rivet assembly for use with aligned panel holes in a plurality of panels which are to be joined together, each panel having an outer surface and an inner surface, said panels being arranged so that an inner surface of one confronts the outer surface of another, said assembly comprising:

a plastic rivet having an expandable rivet shank, said rivet shank comprising a head end and an insertion end and an expendable portion therebetween, a rivet head at said head end of said rivet shank for juxtaposition with the outer surface of one of said panels, and a rivet bore open at opposite ends extending through said rivet head and through said rivet shank, said rivet bore comprising a bore portion of reduced diameter near the head end of said rivet shank;

a drive pin comprising a pin shank insertable in said rivet bore from said insertion end of said rivet shank and having a pin head at one end of said pin shank engageable with the exterior of said insertion end of said rivet shank for effecting expansion of said rivet shank when said drive pin is forced through said rivet bore to an installed position so that said expanded rivet shank is juxtaposed with the inner surface of another of said panels, said pin shank comprising a first portion having serrations thereon and a second break-away portion, said serrations having a greater diameter than said reduced diameter bore portion but a smaller diameter than said rivet bore;

said reduced diameter bore portion being interengageable with said serrations on said pin shank for maintaining said drive pin in said installed position and for maintaining said rivet shank expanded;

and integrally formed sealing means on said rivet between said rivet head and said expandable portion of said rivet shank for abutting the outer surface of at least one of said plurality of panels and to seal the hole therein when said drive pin is in installed position and said rivet shank is expanded, said sealing means comprising at least one annular shaped outwardly extending flexible sealing flange on said rivet shank, said flange having conically shaped inner and outer surfaces.

4,639,176

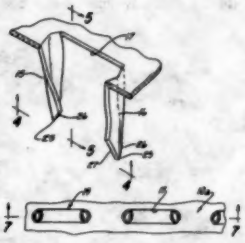
TRUSS PLATE

Glenn C. Smith; James R. Needham, both of 2914 E. Katella Ave., Orange, Calif. 92667, and William T. Turnbull, 1307 W. Sixth St., Suite 114, Corona, Calif. 91720

Filed Jan. 21, 1986, Ser. No. 820,227

Int. Cl.[4] F16B *15/00*

U.S. Cl. 411—468 9 Claims



1. A truss connector plate formed of a stiff, thin sheet metal plate having numerous teeth struck-out of the plate for embedding in wood members for joining said members together to form trusses, beams, and the like construction elements, comprising:

the teeth being aligned in a number of longitudinal rows along the plate, and being formed in pairs that are struck-out of, and extend approximately perpendicularly to, the sheet metal plate with an elongated, longitudinally directed slot between each pair of teeth, and with the adjacent ends of the slots being spaced apart longitudinally;

each tooth being bent along its central axis into a generally V-shaped cross-section, and being radially twisted and predetermined amount from its base to its free end tip, and having an asymmetrical V-shaped tip formed in a V-shape having one leg longer than the other; and,

a second plate, including teeth identically configured to the first mentioned plate, said second plate being arranged in face-to-face contact with the first mentioned plate, with the teeth of the second plate being forcibly inserted through the adjacent slots of the first plate, and the teeth of the second plate being closely arranged to their adjacent teeth of the first plate and due to their twisted configuration and cross-sectional shapes, the adjacent teeth being partially gapped apart along their lengths to form double tooth sets for interlocking with a wood member.

4,639,177

BOOK SEWING MACHINE WITH AUTOMATIC SEPARATION OF BOOKS

Gianattilio Meratti, Carona, Switzerland, assignor to Meccatec S.p.A., Torre de' Roveri, Italy

Filed Sep. 26, 1984, Ser. No. 654,447

Claims priority, application Italy, Sep. 27, 1983, 67998 A/83

Int. Cl.[4] B42C *19/04, 19/08*

U.S. Cl. 412—11 17 Claims

12. A book sewing machine of the chain-stitching type, including a sewing zone and a conveyor horizontally disposed having a receiving end disposed adjacent said sewing zone for receiving and for carrying a horizontal pile of vertically disposed books which have been sewn towards a discharge zone, wherein the improvement comprises an automatic mechanism for separating the books already sewn which includes:

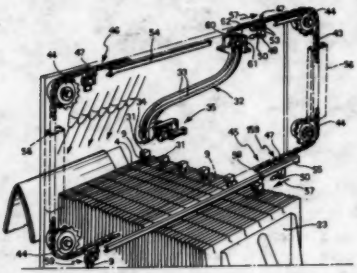
a separator member insertable between two contiguous books located close to the discharge zone and displaceable in a vertical transverse plane relative to the direction of advance of the conveyor from one side conveyor to the other;

a drive device for effecting the insertion and displacement of the separator member, and

a control system for said drive device including at least one indicator element:

a marker device including indicator element insertion means disposed adjacent said receiving end of said conveyor for periodically inserting an indicator element in varying relation to the final signature of each book in said conveyor adjacent the sewing zone, close to the top of a vertical side of each book and;

a sensor located close to the path traveled by the indicator element during the advance of the books towards the



discharge zone so as to detect the passage of the indicator element and to start the working cycle of the drive device of the separator member when the interval between the backs of the contiguous signatures of the books to be separated is in the transverse plane of displacement of the separator member;

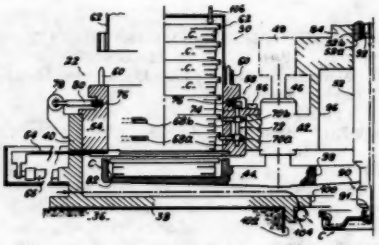
wherein the indicator element also serves as the separator element and comprises a substantially cubic, parallelpipedal block and a plate which projects from the middle of the lower face of the block.

4,639,178

MACHINE PERMITTING THE REMOTE CLOSURE OF DRUMS

Robert Dubat, Octeville, and Claude Jamet, Equeurdreville, both of France, assignors to Commissariat a l'Energie Atomique, France

Filed Jan. 13, 1984, Ser. No. 570,355
Claims priority, application France, Jan. 14, 1983, 83 00525
Int. Cl.[4] B21D *51/30*
U.S. Cl. 413—26 **10 Claims**



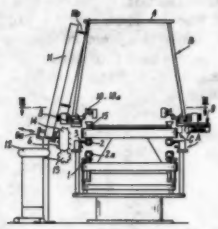
1. A machine for closing drums within a pool, wherein said machine comprises a telescopic pole having at its lower end a gripping head, handling means for moving the latter between a bottom position in the pool and a top position above the pool, transfer means for transferring a cover beneath the gripping head when the latter is in the top position, and control means for putting into action means for attaching the cover to the drum, the handling means, transfer means and control means being positioned above the pool and the gripping head carrying connection means for the control means and attachment means.

4,639,179

DEVICE FOR LOADING A MACHINE FOR THE TREATMENT, NOTABLY THERMAL, OF CYLINDRICAL OBJECTS, NOTABLY IN GLASS, SUCH AS GLASS PIPES

Dominique Soulard, Gauville, France, assignor to Societe Francaise d'Ampoules Mecaniques, Aumale, France

Filed Jun. 7, 1984, Ser. No. 618,363
Claims priority, application France, Jun. 14, 1984, 83 09801
Int. Cl.[4] B65H *1/00*
U.S. Cl. 414—223 **6 Claims**



1. In a system for treating elongated cylindrical objects, particularly glass objects such as glass pipes, said system being of the type including an object treating machine comprising a carrousel rotatable about a vertical axis and having thereabout a plurality of treatment stations whereat the objects are received and treated, and means for supplying objects to be treated to said stations while said carrousel is rotating about said vertical axis, the improvement wherein said supplying means comprises:

a loading barrel mounted above said carrousel for rotation about a vertical axis coaxial with said vertical axis of said carrousel, said barrel having therearound a number of loading stations equal to the number of treatment stations of said carrousel;

coupling means for connecting said barrel to said carrousel to rotate therewith at the same speed during a loading operation, and for disconnecting said barrel from said carrousel during a supplying operation;

indexing means for rotating said barrel to supply said objects to respective loading stations;

means for, when said barrel is disconnected from said carrousel, supplying objects in substantially vertical alignment to said loading stations; and

means for, when said barrel is connected to said carrousel, discharging the loaded objects vertically downwardly from said loading stations to respective said treatment stations.

4,639,180

EQUIPMENT FOR LOADING BARS TO BE MACHINED ON A DEVICE FOR PRESENTING AND FEEDING SAID BARS TO A MACHINE TOOL

Giovanni Cucchi, and Pietro Cucchi, both of Bussero, Italy, assignors to F.LLI Cucchi S.R.L., Bussero, Italy

Filed May 15, 1985, Ser. No. 734,043
Claims priority, application Italy, May 24, 1984, 21909/84[U]
Int. Cl.[4] B65H *3/00*
U.S. Cl. 414—224 **4 Claims**

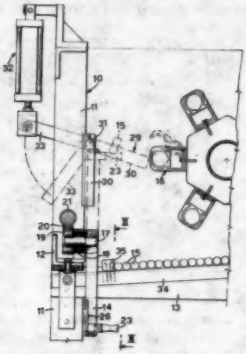
1. A mechanism for lifting bars from a supply of parallel bars in automatic bar loading devices for a machine tool, characterized in that said mechanism comprises

a plurality of arms mounted to rotate in a vertical plane parallel to said bars in said supply,

means on one end of each of said arms for grasping a bar in said supply,

means for driving said arms to displace said grasping means from a first lower position in which one bar is drawn out of said supply and moved by said grasping means to a second upper position,

a rotating comb device, and



means for rotating said comb device for drawing out said one bar from said grasping means and dropping it by gravity onto a channel-shaped jaw, said jaw being suitable for introducing said bar into the machine tool.

4,639,181

PALLET EXCHANGE DEVICE

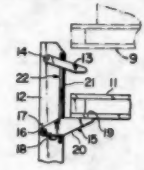
Yuzo Tsubouchi, Osaka, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

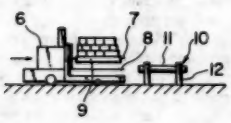
Filed Nov. 26, 1984, Ser. No. 674,550

Claims priority, application Japan, Nov. 28, 1983, 58-182078[U]; Nov. 28, 1983, 58-182079[U]

Int. Cl.⁴ B66F 9/06

U.S. Cl. 414—349 **10 Claims**





1. A pallet exchange device for use with a fork truck having a pair of vertically spaced apart forks which are raised and lowered in unison, said device comprising a plurality of upright stationary members defining therebetween a vertical path of movement for loaded and unloaded pallets, pallet supporting members mounted on said stationary members for movement between extended positions in said path of movement at a common level for supporting one of said pallets, and a retracted position out of said path, said supporting members being biased toward said extended positions, levers located at a position higher than the level of said pallet supporting members by a distance less than the vertical spacing between said pair of forks, said levers being mounted on said stationary members and each having a part to be displaced into or out of said path, connecting means having a plate for each supporting member, said plate being vertically guided by a stationary member, said connecting means adapted to engage both said levers and said supporting members so as to be displaced when said lever parts are engaged by a pallet being raised by the lower of said pair of forks and caused to move upwardly, and operable to displace said pallet supporting members to their retracted positions and latch said supporting members so that they remain in said retracted positions, said lever parts when moved downwardly by a pallet being lowered by the upper of said pair of forks, displacing said connecting means to unlatch said supporting members and allow them to return to their extended positions.

4,639,182

CRANE DEVICE INSTALLED IN CARGO TRANSPORTING VEHICLE

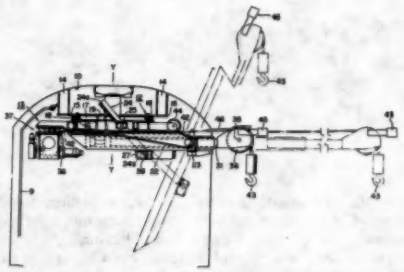
Mitsuharu Inaba, Utsunomiya; Takashi Sekiguchi, Tochigi; Yoshio Yoneyama, and Tadashi Suzuki, both of Utsunomiya, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,650

Claims priority, application Japan, Aug. 26, 1983, 58-132113[U]; Aug. 26, 1983, 58-132114[U]; Aug. 26, 1983, 58-132115[U]

Int. Cl.⁴ B60P 1/54

U.S. Cl. 414—543 **3 Claims**



1. A crane device installed in a cargo transporting vehicle with a roof structure and comprising:

a revolvable frame supported by the roof structure in a suspended manner permitting revolution of the revolvable frame about a vertical axis;

a derrick boom assembly luffably supported by the revolvable frame and having a boom adapted to be extendible forward and contractible rearward in the longitudinal direction thereof;

a winch means mounted on the revolvable frame and having a winding drum, a length of wire rope, a portion of which is secured to and wound around the winding drum, the remaining outer portion of which is led to the extreme forward end of the boom, and a cargo hook adapted to be lowered and raised from said forward end by the wire rope unwound from and wound up on the winding drum;

first driving means for driving the revolving frame in revolution;

second driving means for driving the boom assembly in luffing movement;

third driving means for driving the boom in extending and contracting movement;

fourth driving means for driving the winch means in the operation thereof;

motive power means for each of the first through fourth driving means;

a safety system having a tactile sensor mounted on the extreme front end of the boom and operating to stop movements of the boom when the tactile sensor contacts an object;

the tactile sensor comprises:

a pair of bell cranks pivotally supported on the extreme front end of the boom by respective pivot pins disposed apart and symmetrically on opposite lateral sides of the boom centerline, each bell crank having an inner arm and an outer arm pin connected to a tactile feeler;

a detector rod slidably supported on the boom to move longitudinally rearward upon being pressed at a front end thereof by said inner arms of the bell cranks when the tactile feeler contacts an object;

a spring urging the detector rod in the forward direction; and

a detection switch operable in closing and opening action by the detector rod.

4,639,183

BUCKET EXCAVATOR

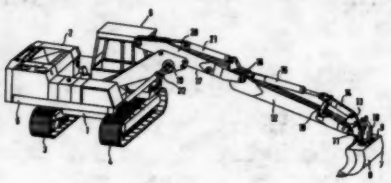
Wilfred Güthoff, Witten, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Filed Mar. 27, 1985, Ser. No. 716,582

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411866

Int. Cl.⁴ E02F 5/02

U.S. Cl. 414—705 **6 Claims**



1. A bucket excavator having a working implement which is connected to a bucket arm with an operating hinge for movement about an operating hinge axis, and having a drive which comprising first and second working cylinders attached on opposite sides of the operating hinge axis for moving the working implement about the operating hinge axis; the bucket excavator characterized by the operating hinge being attached to a clamp having first and second clamping feet, at least the first clamping foot being movable about a clamping hinge axis which coincides with the operating hinge axis, the first clamping foot being connected to the first working cylinder, and the first clamping foot opposing the second clamping foot to form a gripper for engaging connections provided on the working implement for attaching the operating hinge to the working implement, said connections cooperating with the clamping feet to provide a locking arrangement when the clamping feet are in a gripping position.

4,639,184

SAFETY COUPLING DEVICE FOR ROBOTIC TOOLING

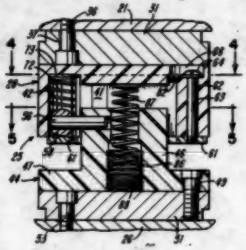
Harold E. Knasel, Springfield, and David A. Grigsby, Medway, both of Ohio, assignors to Process Equipment Company, Tipp City, Ohio

Filed Mar. 6, 1985, Ser. No. 708,561

Int. Cl.⁴ B25J 9/00

U.S. Cl. 414—730 **15 Claims**

1. A safety coupling device adapted for connecting tooling to the movable arm of a robot to protect against inadvertent damage to the robot and/or tooling and to minimize down time of the robot, said device comprising a first support member, means for rigidly securing said first support member to the arm of the robot, a second support member, means for rigidly securing said second support member to the tooling, means connecting said first and second support members and providing for relative universal tilting movement between said first and second support members from a normal position where said first support member is in predetermined relation to said second support member, means for biasing said first and second support members toward said normal position, control means



responsive to said tilting movement for stopping the movement of the arm of the robot, said connecting means including a set of relative movable electrically conductive elements, said control means including an electrical circuit with means for electrically connecting said elements in series, and said circuit opens by separation of at least two of said elements in response to said tilting movement of said support members.

4,639,185

BAG PACKAGE TRANSFER APPARATUS

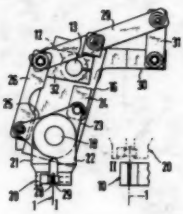
Walter Gressler, Bergisch-Gladbach, and Karl Kern, Schwalmtal-Amern, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,363

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, 3501771

Int. Cl.⁴ B25J 3/00

U.S. Cl. 414—733 **3 Claims**



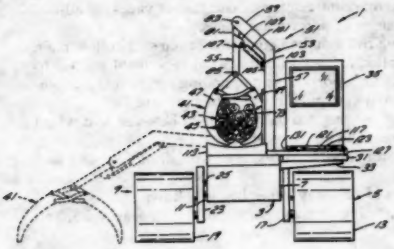
1. In a packaging machine the combination comprising a bag transfer apparatus for transferring bags in a vertical orientation, said apparatus having a pivot arm, a pair of tongs hinged to the pivot arm and including jaw means for grasping a flat bag at a first station, first lever means for pivoting said pivot arm to traverse said bag through a fixed path by a swinging movement of the pivot arm so as to position said flat bag onto a conveyor apparatus at a second station, a second lever means being linked to parallel spaced-apart connecting rod means by crank means, said connecting rod means being aligned substantially symmetrically adjacent to said pivot arm said crank means being linked to a first end of said connecting rod means by a coupling element and said tongs are articulated by a second end of said connecting rod means, said connecting rod means maintaining said bags in said vertical orientation during pivoting of said pivot arm and operable by said second lever means to open and close said tongs at said first and second stations, said first and second lever means are connected to individual and separate drive means.

4,639,186

FORWARDER

Per-Gustaf Mellgren, Beaconsfield, Canada, assignor to Forest Engineering Research Institute of Canada, Pointe Claire, Canada

Filed Nov. 27, 1984, Ser. No. 675,182
Claims priority, application Canada, Dec. 12, 1983, 443121
Int. Cl.[4] B60P 1/00
U.S. Cl. 414—734 4 Claims



1. A vehicle for loading and transporting elongated articles, the vehicle having: a chassis; a first wheel support beam having a powered wheel unit at each end and fixedly mounted to the chassis on one side of the chassis; a second wheel support beam having a powered wheel unit at each end and pivotally mounted to the chassis on the other side of the chassis with a pivot pin; the axis of the pivot pin being horizontal and extending transverse to the longitudinal axis of the vehicle; a grapple for picking up a single full load of elongated articles and holding the load on the chassis with the articles generally parallel to the longitudinal axis of the vehicle; grapple arm means for mounting the grapple on the vehicle; pivot means pivotally mounting one end of the grapple arm means at about the longitudinal center of the chassis, the axis of the pivot means extending generally parallel to the longitudinal axis of the vehicle; means pivotally mounting the grapple to the other end of the grapple arm means; and means for moving the grapple arm means in a direction transverse to the longitudinal axis of the vehicle to move the grapple between a first article loading position adjacent the other side of the chassis and a second article carrying position over the chassis, said grapple moving in a vertical plane that extends transverse to the longitudinal axis of the vehicle, the axis of the pivot pin of the second wheel support beam, and the center of gravity of the vehicle located close to, or within, the vertical plane.

4,639,187

AUTOMATIC STORING EQUIPMENT

Asao Maruyama, and Kokzo Miyagawa, both of Osaka, Japan, assignors to Tsubakimoto Chain Co., Japan

Filed Jul. 16, 1984, Ser. No. 630,951
Int. Cl.[4] B65G 1/06
U.S. Cl. 414—787 16 Claims

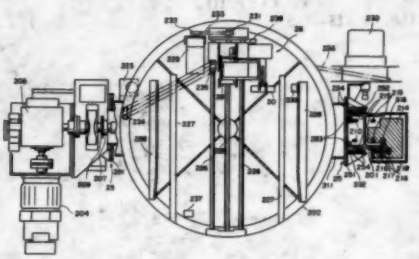
1. An automatic storing equipment which is capable of automatically storing articles onto each shelf at a carrousel and of automatically taking out the same from each shelf, characterized by providing

pallets for putting thereon said articles and having a power-feeding part to said put on article and two power-receiving parts connected with said power-feeding part,

a loading/unloading machine for storing said pallets onto each shelf and taking out the same therefrom, and

a carrousel means formed in multitiered and multirow construction and capable of stopping the predetermined row at the position where said loading/unloading machine is installed, each of said shelves having a power-feeding part engageable with one power-receiving part at said pallet,

said loading/unloading machine being provided with: a turntable means which is capable of lifting and lowering; a shifting means provided on said turntable means and movable horizontally for storing and/or taking out said articles and having a pallet chucking mechanism, and a power-feeding mechanism engageable with another power-receiving part on said pallet, for supplying power to said another power-receiving part of said pallet for energizing said article from the time it is placed on said loading/unloading machine before storing, to the time when said article is removed from said loading/unloading machine after storing.

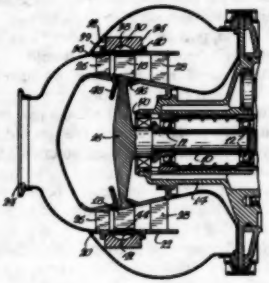


4,639,188

TURBINE WHEEL CONTAINMENT

Gerald L. Swadley, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 4, 1984, Ser. No. 677,874
Int. Cl.[4] F01D 21/00, 25/24
U.S. Cl. 415—9 9 Claims



1. A turbine assembly, comprising:

a turbine wheel journalled for rotation about an axis, and having a plurality of turbine blades generally radially extending away from said axis in at least one stage;

a containment ring having a central opening surrounding said blades and spaced radially outwardly thereof, the radially inner surface of said ring including a radially inwardly opening groove; and

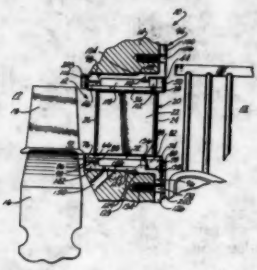
first and second, generally axially extending, deformable housings for said turbine wheel, said housings being radially outwardly of said blades and radially inwardly of said ring and sandwiching said ring to maintain said ring in axial alignment with said blades, said housings having portions overlapping and closing said groove without substantially entering the same and mounting turbine structure extending radially inwardly toward said axis to at least partially flank said blades in axially spaced relation thereto.

4,639,189

HOLLOW, THERMALLY-CONDITIONED, TURBINE STATOR NOZZLE

Irwin E. Rosman, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 27, 1984, Ser. No. 584,039
Int. Cl.[4] F01D *5/18, 25/08, 9/04*
U.S. Cl. 415—115 17 Claims



1. A stator nozzle for guiding the fluid flow from a forward inlet to the blades of a turbine comprising:

a plurality of vanes arranged annularly to define the stator nozzle, each vane having a body adapted to guide fluid flow and with a substantially radially extending axis, said body disposed between outer and inner ends, each vane having a hollow core extending radially therethrough;

a forward lug disposed on and projecting outward from each of the outer and inner ends;

a rear lug disposed on and projecting outward from each of the outer and inner ends to the rear of the forward lugs;

a floating support for each vane in the turbine to permit each vane to adjust in its respective radial and tangential directions to evenly distribute loads to each forward and rear lug, the floating support including a pair of concentrically arranged annularly spaced forward shoulders, the forward shoulders spaced from the outer and inner ends and adapted to abut the forward lugs of each vane to prevent the vanes from moving rearwardly, and a pair of concentrically arranged, annularly spaced rear shoulders in the turbine, the rear shoulders having notches adapted to loosely receive the rear lugs of each vane to confine tangential movement thereof, the spaces between the forward and rear shoulders defining outer and inner chambers communicating with the vane core at the outer and inner ends of each vane, a portion of the fluid passing directly through the cores to minimize thermal stresses on the vanes; and

a first ring seal for each vane adapted to overlay and seal any openings between the vane and the rear shoulder at the outer end to prevent fluid from flowing rearwardly out of the outer chamber past said rear lug.

4,639,190

TUBULAR WATER WHEEL

Jiro Ohta, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,121
Claims priority, application Japan, May 16, 1984, 59-98388
Int. Cl.[4] F01D *15/10*; F03B *3/06, 3/14*
U.S. Cl. 415—129 7 Claims

1. A tubular water wheel, comprising:

a draft tube;

a stationary stay ring fixably mountable to said draft tube;

a stationary wheel inner case;

a plurality of stay vanes rigidly mounting said wheel inner case within said stay ring;

a main shaft having one end for mounting thereon a generator and having an opposite end;

a runner fixedly mounted coaxially to said opposite end of said main shaft;

a hollow main shaft portion fixedly mounted to said runner on the side opposite from and coaxial with said main shaft;

a plurality of runner vanes mounted on said runner respectively for rotation about generally radial axes;

linkage means connected to said runner vanes and having an input within said runner for converting a reciprocating input to rotary movement of said runner vanes for adjusting the angle of said runner vanes;

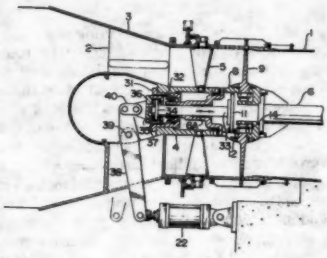
an operating rod mounted coaxially within said hollow main shaft portion for reciprocating axial movement relative to said main shaft portion, said operating rod having a downstream axial end and an upstream axial end;

a main shaft bearing coaxially mounted between said wheel inner case and said main shaft portion;

a servo-motor mounted outside of said draft tube and said stay ring;

at least one of said stay vanes being hollow;

a lever extending through said one hollow stay vane, and



said lever having one end drivingly connected to said servo-motor, a midportion rotatably connected to said vane, and an opposite end;

said main shaft bearing including a stationary bearing support portion;

one of the downstream end of said hollow mainshaft portion and said bearing support portion having an inner cylindrical surface;

a bearing retainer portion having a cylindrical exterior in axial sliding engagement with said cylindrical surface coaxially with said main shaft;

a propelling force receiving plate fixably mounted on said operating rod;

a thrust bearing mounted between said propelling force receiving plate and said bearing retainer portion;

link means drivingly connecting said opposite end of said lever to one of said bearing retainer portion and said operating rod and the other of said operating rod and said bearing retaining portion being drivingly connected to said linkage means input so that said servo-motor will oscillate said lever, reciprocate said bearing retaining portion, reciprocate said operating rod, and rotatably adjust the angle of said runner vanes.

4,639,191

CENTRIFUGAL FAN LINER AND INSTALLING TOOL THEREFOR

Joseph D. Hart, San Marcos, Calif., and R. Leon Wells, 1649 Manor Dr., Vista, Calif. 92083, assignors to R. Leon Wells, Vista, Calif.

Continuation-in-part of Ser. No. 500,079, Jun. 1, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,230
Int. Cl.[4] B23Q *3/00*; F04D *29/42*
U.S. Cl. 415—196 2 Claims

1. In a plastic base of an upright vacuum cleaner that in-

cludes a plastic fan chamber defined by first and second flat involute-outlined plastic chamber surfaces spaced apart by an outer plastic wall terminating at edges defining a chamber outlet, a chamber inlet in the first chamber surface, and a centrifugal fan including a fan plate rotably mounted adjacent the second chamber surface and vanes radially mounted thereon for spinning within the chamber, the improvement of a retrofittable thin metal liner, adapted for adhesive attachment to the first chamber surface, and a portable installation clamp therefor, for temporarily clamping said liner tightly to the surface, said clamp fully manipulative from only one side of the vacuum cleaner base, said metal liner comprising:

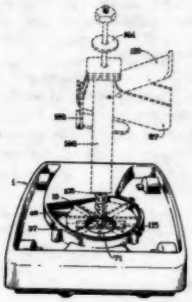
(a) a flat metal plate having an outer-involute shaped perimeter substantially the same size and outline as the first chamber surface and having an inner edge of similar shape and location and slightly larger in size than the chamber inlet;

(b) upstanding metal wall attached to said plate around the outer perimeter thereof terminating at edges defining the chamber outlet and of a height sufficient to span the distance between the first and second chamber surfaces snd terminating at the top edge of the outer plastic wall;

(c) said liner aligned in tight registration with the terminating edges of the outer wall at the chamber outlet;

(d) adhesive means for mounting said liner in the chamber; said portable clamp comprising:

(e) a clamp handle;



(f) a shaft extending from said handle having first and second ends adapted for reciprocal motion;

(g) first means on said shaft adapted to pass through the first chamber surface out through the chamber inlet for reversibly abutting the opposite side of the first chamber comprising a strap transversely and securely mounted on said shaft having a length greater than the width of the chamber inlet and adapted to pass through the chamber inlet by tilting said shaft first one way, to pass one part of said strap through, then tilting said shaft the other way to pass the other part through and thereafter straighten said shaft to cause said strap to span the chamber inlet on both sides thereof and abut the back side of the base parallel to the plane of said flat metal plate;

(h) second means slidingly received on said shaft, including a surface substantially similar to the shape and size of said flat metal plate of said liner, for abutting said liner and providing full pressure over the entire surface thereof;

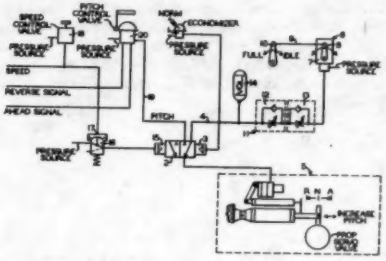
(i) third means cooperative with said handle to cause said shaft to withdraw and draw said first means and said second means under intense hand pressure for squeezing and holding said liner into tight registration with said first chamber surface during the entire adhesive operation, comprising a squeezable trigger pivotally mounted to said handle, a drive plate having an aperture formed therein for receipt therethrough of said shaft and adapted to tilt and jam against said shaft under action of said trigger, forcing said plate and shaft rearward of said handle and to slide in a forward direction independent of said shaft under bias pressure when released by said trigger, a catch plate having an apertured formed therein for receipt therethrough of said shaft and adapted to slide independent of said shaft as said shaft moves in a rearward direction and to tilt and jam against said shaft and prevent forward motion thereof when said trigger is released and reset for another cycle of urging said shaft in a rearward direction, means biasing said trigger apart from said handle and biasing said drive plate in sliding contact with said shaft adapted to be overcome by hand squeezing to actuate said drive plate and drive said shaft rearward and urge said first means and said second means together, means biasing said catch plate to allow said shaft to pass rearward therethrough and tilting and jamming thereon to prevent forward motion thereof, and means in cooperation with said catch plate to overcome said bias means to allow release and forward motion of said shaft to release said clamp pressure.

4,639,192

PROPELLER PITCH CONTROLLING ARRANGEMENT HAVING A FUEL ECONOMIZING FEATURE

David P. Harrell, Metairie, La., assignor to American Standard Inc., Lexington, Ky.

Filed Apr. 11, 1984, Ser. No. 599,043
Int. Cl.[4] B63H *3/10*
U.S. Cl. 416—27 **6 Claims**



1. A propeller pitch controlling arrangement having a fuel economizer feature for use on marine vessels having an engine fuel rack and a variable pitch propeller, said propeller pitch controlling arrangement comprising:

(a) a pitch controlling servomechanism operably engaged to the variable pitch propeller such that the pitch of the variable pitch propeller is controlled as a function of the amount of fluid pressure delivered thereto;

(b) a fluid steering valve connected to said pitch controlling servomechanism and operable to one of a first and second valve position wherein fluid pressure from one of associated respective first and second flow paths is directed to said pitch controlling servomechanism;

(c) said fluid steering valve having respective first and second pilot operated portions which, when actuated by respective first and second pilot signals, effect movement to such first and second valve positions, such first and second valve positions being mutually exclusive in operation;

(d) a relay valve receptive of fluid pressure having a value determined by the marine vessel speed, said relay valve being connected to said first pilot portion of said fluid steering valve such that, upon reduction of such speed determined fluid pressure below a preselected value, such first pilot signal is transmitted to said fluid steering valve and said first flow path is established thereby;

(e) a pitch control valve manually operable over a range of fluid pressure delivery settings such that, when said first flow path is established, a first operating fluid pressure is

transmitted thereover to said pitch controlling servomechanism;

(f) a mode selector valve manually operable to an economizer position and spring returnable to a normal position, such operation to the economizer position effecting a pulse-type transmission of such second pilot signal to said second pilot portion of said fluid steering valve such that said second flow path is established thereby;

(g) economizer valve means mechanically linked to such marine vessel engine fuel rack for transmitting a second operating fluid pressure to said pitch controlling servomechanism when said second flow path is established, such second operating fluid pressure being in inverse proportion to movement of such marine vessel engine fuel rack; and

(h) such first pilot signal being continuous in duration when such speed determined fluid pressure has been reduced below such preselected value, such first pilot signal thereby overriding such pulse-type second pilot signal in the event such first and second pilot signal occur simultaneously.

4,639,193

FAN WHEEL FOR RADIAL FAN

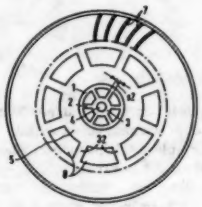
Gerhard Reichert, Coburg, and Friedrich Riedel, Redwitz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,399

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3441077

Int. Cl.[4] F04D *29/28*

U.S. Cl. 416—184 10 Claims



1. A radial fan wheel comprising:

a hub having an axial length and including an inner hub ring and an outer hub ring, said outer hub ring being coaxial with said inner hub ring, said inner hub ring being fastenable to a rotary output shaft of a drive motor;

resilient means disposed between said inner hub ring and said outer hub ring for damping pulsations in torque transmitted from said drive motor, said resilient means including a plurality of planar resilient strips connecting said inner hub ring to said outer hub ring, said resilient strips extending in radial planes and having axial lengths smaller than the axial length of said hub, each of said resilient strips being axially staggered with respect to two of said resilient strips adjacent thereto;

a blade ring coaxial with said hub;

a multiplicity of fan blades fixed to said blade ring, said blades being circumferentially equispaced about said blade ring; and

an annular intermediate section connected at an inner periphery to said hub and at an outer periphery to said blade ring.

4,639,194

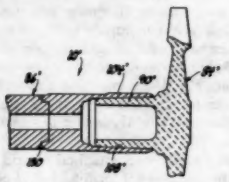
HYBRID GAS TURBINE ROTOR

Albert H. Bell, III, Birmingham, and Jesse F. Johnson, St. Clair Shores, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 2, 1984, Ser. No. 606,268

Int. Cl.[4] F01D *5/34*

U.S. Cl. 416—241 B 2 Claims



1. In a hybrid turbine rotor for a gas turbine engine, the combination comprising, a ceramic turbine wheel portion having a plurality of turbine blades therearound, a hollow ceramic stub shaft integral with said ceramic turbine wheel portion having a first coefficient of thermal expansion and a frustoconical outer surface with a predetermined taper angle and defining in cross section an annulus of predetermined area, said stub shaft being perpendicular to the plane of said turbine wheel portion with said frustoconical outer surface tapering axially away from said turbine wheel portion so that heat flow between said stub shaft and said turbine wheel portion is only through said annulus of predetermined area, an alloy metal shaft portion, and an alloy metal tubular end welded to said alloy metal shaft portion having a second coefficient of thermal expansion exceeding said first coefficient of thermal expansion and a frustoconical inner surface axially tapering toward said shaft at a taper angle corresponding to said outer surface taper angle, said tubular end being shrunk fit over said stub shaft on the opposite side of said annulus of predetermined area from said turbine wheel portion and with predetermined diametral interference between said outer and said inner surfaces at all operating temperatures of said hybrid rotor whereby torque transfer between said stub shaft and said tubular end occurs only at the shrunk fit interface between said outer and said inner surfaces and whereby all heat flow between said alloy metal shaft portion and said turbine wheel portion is through said annulus of predetermined area.

4,639,195

POWER CONTROL DEVICES FOR HYDROSTATIC PUMPS

Jurgen Norskau, Lohr, and Rudolf Richter, Hosbach, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 28, 1984, Ser. No. 687,524

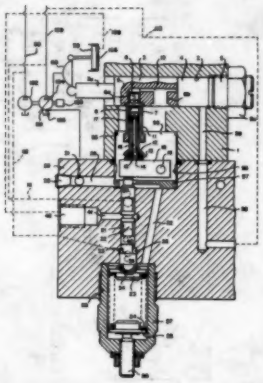
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401818

Int. Cl.[4] F04B *1/26*

U.S. Cl. 417—216 15 Claims

1. In a control device for an adjustable hydrostatic pump having a housing containing a servo piston acting on an adjusting member of the pump, a lever pivoted at one end and adjacent the other end bearing on a piston control valve that regulates the pressure loading on the servo piston, the improvement comprising pressure measuring piston loaded with feed pressure having one end slidably bearing against the lever between the pivot and said other end, said piston control valve acting on the lever opposite the pressure measuring piston, resilient means acting against the piston control valve opposite the lever biasing it toward the pressure measuring piston, a structural member fixed on the servo piston and movable therewith carrying said pressure measuring piston and a lever housing attached to said servo piston housing carrying a lever pivot

support means for the lever and a borehole for the piston control valve and resilient means, a slide shoe located between the pressure measuring piston and lever and slides on said lever



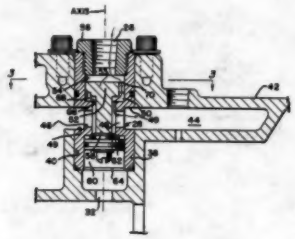
as the pressure measuring piston moves with the servo piston and wherein pressure fluid feed means is provided in the pressure measuring piston providing a pressure fluid cushion between the lever and slide shoe.

4,639,196

FLUID CONTROL VALVE

Thomas R. Kirkland, Jr., Mooresville, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 12, 1986, Ser. No. 828,673
Int. Cl.[4] F16K *31/122*
U.S. Cl. 417—228 **12 Claims**



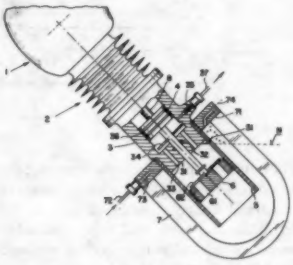
1. A fluid control valve, comprising:
a housing having a given axis and a bounding, circumferential, inner wall;
a piston, in said housing, having a head (a) movable along said axis, and (b) subdividing said housing into inner and outer chambers;
first means for admitting fluid into said outer chamber; and
second means for discharging fluid from said inner chamber; wherein
said head has outermost, circumferential surfaces engaged with said wall for guiding said piston in its axial movement;
said head has conduit means for effecting fluid communication between said chambers; and further including
a land, in said housing, intermediate opposite ends of said housing; wherein
said head has a shoulder for closure thereof onto, and for removal thereof from, said land to interdict, and to permit, fluid communication between said chambers;
said conduit means comprises a plurality of channels formed in said head;
said outermost circumferential surfaces are interrupted by said channels of said plurality thereof; and
said channels are radially outwardly disposed, relative to said shoulder.

4,639,197

PUMP FOR CRYOGENIC FLUIDS

Jean Tornare, Hauptstrasse 49, CH 4422 Arisdorf/BL; Klaus Bofinger, Fuchsmattstrasse 13, CH 4107 Ettingen, and Claudio Tschopp, Lachmattstrasse 21, CH 4132 Muttenz, all of Switzerland

Filed Feb. 4, 1985, Ser. No. 697,756
Claims priority, application Switzerland, Jul. 20, 1984, 3535/84
Int. Cl.[4] F04B *3/00, 15/08*
U.S. Cl. 417—259 **6 Claims**



1. Pump for cryogenic fluids, having a high pressure part and a supercharger part, the high pressure part and the supercharger part each comprising a piston pump (3,4) (5,6) disposed in tandem and separated from one another by a partition (31) the pistons having a common piston rod (8) which slidably and sealingly extends through said partition, said partition being provided with an intake valve (33,34) the supercharger part being disposed in a heat insulated intermediate fluid container in sealing relationship with said partition, providing a sump for said supercharger part, said supercharger part comprising a cylinder (5) open at the intake side and a piston (6) provided with an intake valve (61,62) the supercharger cylinder (5) having a larger inside diameter than the high pressure cylinder (3), volume equilibrium being attained by an opening (51) provided at the highest point of said supercharger - cylinder, said opening emptying into the intermediate fluid container (7).

4,639,198

SUCTION TUBE SEAL FOR A ROTARY COMPRESSOR

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 670,306, Nov. 13, 1984, abandoned. This application Feb. 20, 1986, Ser. No. 830,500
Int. Cl.[4] F04B *17/00, 35/04*
U.S. Cl. 417—410 **7 Claims**

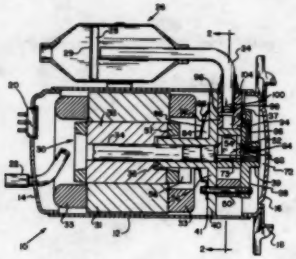
1. A hermetic rotary compressor comprising:
a housing;
an electric motor operatively disposed within said housing and having a rotatable rotor;
a unitary suction tube sealingly secured to said housing and having an end portion thereof extending into said housing;
a cylinder disposed within said housing in axial alignment with said rotor and connected to the interior wall of said housing, said cylinder having a cylindrical bore therein;
a rotatable crankshaft received within said bore and driven by said rotor for driving a piston means inside said bore and compressing refrigerant therein;

a discharge port in said cylinder for discharging compressed refrigerant from said bore;

an aperture in the cylindrical wall of said cylinder in communication with said bore;

said suction tube end portion having a smaller outside diameter than the inside diameter of the aperture, said tube end being axially slidably disposed within said aperture;

resilient sealing means for sealing said suction tube end in said cylinder aperture and preventing refrigerant from leaking past said suction tube sealing means while permitting axial movement of said tube end in said aperture; and



a suction tube adapter means for securing the suction tube to the cylinder housing, said adapter means comprising a first cylindrical flange member adapted to fit over said tube and in contact with said tube, said adapter including a second cylindrical portion having a diameter greater than the outside diameter of said suction tube, a third transition portion for connecting said first and second portions, said second portion being in intimate contact with the housing of said compressor.

4,639,199

TWO-SHAFT VACUUM PUMP WITH INTERNAL COMPRESSION

Heinz Frings; Hans-Peter Kabelitz, both of Cologne, and Karl-Heinz Ronthaler, Zulpich, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 596,099, Apr. 2, 1984, abandoned. This application Jan. 30, 1986, Ser. No. 824,308

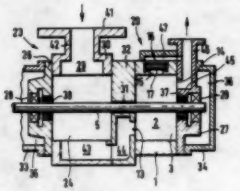
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312117

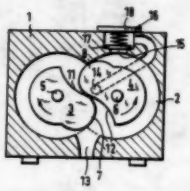
Int. Cl.[4] F04C *18/18, 23/00, 25/02*

U.S. Cl. 418—3 **18 Claims**

1. In a two-shaft vacuum pump having an enclosed, hollow casing, an inlet port into the hollow casing, two rotors on respective parallel shafts for rotation in the hollow casing, and an outlet port in a side of the casing normal to the shafts, each rotor having at least one protruberance and at least one indentation cooperative with the other on the other rotor and the hollow casing for cylically drawing gas in the inlet and compressing it at the outlet when the shafts correspondingly rotate the rotors, whereby the location of the outlet determines a characteristic of the vacuum-pumping operation of the vacuum pump, the improvement comprising:

means for accommodating higher inlet pressures by relieving excessive compression pressures comprising a further outlet port (15) in a peripheral side of the casing parallel to the shafts and communicating with a place in the hollow casing at which the gas is compressed for the other outlet; and a pressure relief valve (16) responsive to the com-





pressed pressure in the hollow casing and operative on the further outlet port.

4,639,200

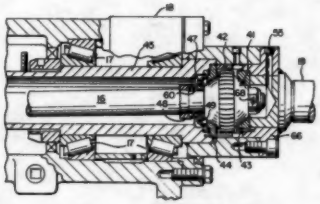
SEALING APPARATUS FOR A GEAR BALL JOINT

Terry A. Baumgardner, Springfield; Jere L. Krouse, Urbana, and Alan G. Wild, Woodstock, all of Ohio, assignors to Robbins & Myers, Inc., Springfield, Ohio

Filed May 9, 1985, Ser. No. 732,119

Int. Cl.[4] F04C *18/22;* **F16J** *15/32;* **F16D** *3/16*

U.S. Cl. 418—48 **5 Claims**



1. In a progressing cavity pump comprising a stator, a helical rotor mounted within said stator, a connecting rod connected to said rotor by means of a first gear ball joint, an annular drive shaft surrounding said connecting rod and connected thereto by a second gear ball joint comprising a gear ball mounted on said connecting rod, a ring gear for driving said gear ball, a primary thrust plate for supporting said gear ball on the surface thereof which is remote from said first ball joint, and a secondary thrust plate for supporting said gear ball on the surface thereof which faces said first ball joint; improved sealing means comprising:

a circumferentially extending recess in the interior surface of said drive shaft, said recess surrounding said connecting rod and facing said secondary thrust plate,

a circumferentially extending step on said secondary thrust plate spaced apart from and opposing said recess,

a flexible seal mounted sealingly around said connecting rod and sealingly between said step and said recess, and

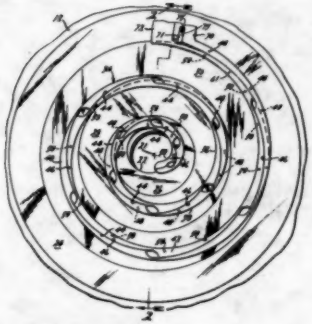
a stiff support wire molded interiorly within said flexible seal member in that portion thereof which is positioned between said recess and said step.

4,639,201

SCROLL-TYPE MACHINE WITH VARIABLE WRAP THICKNESS

Jean-Luc Caillat, Dublin, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Sep. 12, 1985, Ser. No. 775,154
Int. Cl.[4] F01C *1/04, 21/16;* **F04C** *18/04, 29/10*
U.S. Cl. 418—55 **29 Claims**



1. A scroll member for a scroll-type machine, comprising:
an end plate;
a spiral wrap affixed to said end plate, said wrap having a radially outer wrap section having an outer flank surface and a separate radially inner wrap section having an inner flank surface; and
actuating means for moving one wrap section with respect to the other wrap section to vary the space between said inner and outer flank surfaces and thereby change the effective thickness of said wrap.

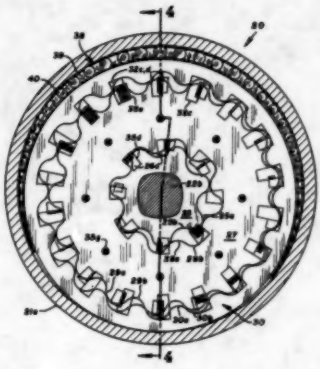
4,639,202

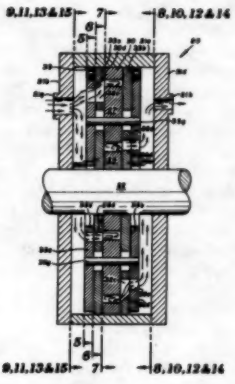
GEROTOR DEVICE WITH DUAL VALVING PLATES

Joseph W. Mahaney, 12018 Mississippi Dr., Champlin, Minn. 55316, and Lester D. Savage, 1010 W. Stroughton St., Urbana, Ill. 61801

Filed Feb. 6, 1985, Ser. No. 698,906
Int. Cl.[4] F01C *1/10, 11/00;* **F03C** *2/08;* **F04B** *17/00*
U.S. Cl. 418—59 **11 Claims**

1. A rotary motion fluid device including:
a. a fluid retaining housing having at least a fluid inlet and a fluid outlet;
b. a first gear member arranged for rotation within said housing and providing an outer peripheral surface defining a plurality of gear teeth thereon;
c. a first pair of valving plates arranged on opposite sides of said gear member and for rotation with said gear member and each having a plurality of flow passages therethrough for the inlet and exhaust of fluid from areas defined by said teeth of said gear;
d. a stationary ring gear member arranged interiorally of said housing and being radially spaced from said first gear member and providing an inner peripheral surface defining a plurality of gear teeth thereon;
e. a pair of stationary valving plates arranged on opposite sides of said stationary ring gear and having each having a plurality of flow passages therethrough for the inlet and exhaust of fluid from areas defined by said teeth of said gear;
f. a rotor ring gear arranged intermediate said first and said stationary gear members and providing an inner and outer peripheral surface, each such surface defining a plurality of gear teeth thereon, the diametric dimension of said ring gear permitting both orbital and rotational movement within the area defined between said first gear member and said stationary gear;
g. said inner and outer teethed surfaces of said rotor ring gear and the respective teeth of said first gear member and said stationary gear member providing a plurality of expanding and contracting chambers as relative motion exists therebetween upon flow of fluid through said housing;
h. a pair of valveplates arranged on opposite sides of said rotor ring and moveable therewith, each of said rotor





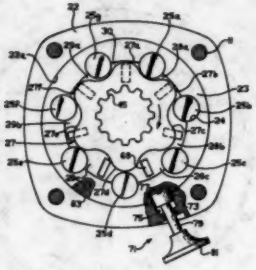
valveplates providing a first set of valving passages defined therethrough in a radial position to communicate with said flow passages of said pair of first valving plates and a second set of valve passages defined therethrough in a radial position to communicate with said flow passages of said stationary valve plates; and,
i. means for introducing fluid under pressure to said housing inlet for distribution to the chambers defined by said rotor ring, said stationary ring and said gear member to produce rotation of said first gear member.

4,639,203

ROTARY FLUID PRESSURE DEVICE HAVING FREE-WHEELING CAPABILITY

Steven J. Zumbusch, Eden Prairie, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 26, 1985, Ser. No. 748,787
Int. Cl.[4] F01C 1/10, 21/16; F03C 2/08
U.S. Cl. 418—61 B 12 Claims



1. A rotary fluid pressure device of the type including housing means defining inlet means and fluid outlet means; a rotary fluid energy-translating displacement means associated with said housing means and including a rotary assembly and a normally stationary reaction-torque-receiving means, operably associated with said rotary assembly and with said housing means whereby, when said reaction-torque-receiving means is stationary, rotation of said rotary assembly defines expanding and contracting fluid volume chambers, said rotary fluid energy-translating displacement means comprising a means of the type wherein said normally stationary reaction-torque-receiving means defines a fluid chamber, and said rotary assembly is disposed within said reaction-torque-receiving means to separate said fluid chamber into said expanding and contracting fluid volume chambers in response to said rotation of said rotary assembly; means operable to communicate fluid from said fluid inlet means to said expanding fluid volume chambers and from said contracting fluid volume chambers to said fluid outlet means; input-output shaft means and means operable to transmit torque between said input-output shaft means and said rotary assembly; characterized by:

(a) an engagement member operably associated with said housing means and said normally stationary reaction-torque-receiving means; and

(b) actuation means operably associated with said engagement member and operable to move said engagement member between:

(i) a first position in which said engagement member is disposed to prevent rotational movement of said reaction-torque-receiving means relative to said housing means, whereby said rotary assembly has said normal rotation to define said expanding and contracting fluid volume chambers; and

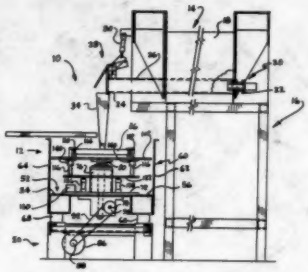
(ii) a second position in which said engagement member is disposed to permit rotational movement of said reaction-torque-receiving means relative to said housing means, whereby rotation of said rotary assembly does not result in the normal relative movement between said reaction-torque-receiving means and said rotary assembly, and said fluid volume chambers do not expand and contract.

4,639,204

APPARATUS FOR CENTRIFUGALLY CASTING CONCRETE PANELS

R. Jack Munsey, Caledonia; Leroy D. DeJong, Spring Lake, and Charles P. Keip, Grandville, all of Mich., assignors to C-Tec, Inc., Grand Rapids, Mich.

Filed Jun. 12, 1985, Ser. No. 743,987
Int. Cl.[4] B28B 1/20, 7/22
U.S. Cl. 425—3 13 Claims



1. An apparatus for centrifugally casting a rectangular access floor panel and the like, said apparatus comprising:

a frame;

a turntable;

means supported on said frame and operatively connected to said turntable for rotating said turntable about a vertical axis;

vibration means operatively connected to said turntable for vibrating said turntable;

a mold defining a cavity, said mold further defining a central sprue aperture; and

turntable clamp means supported on said turntable for clamping said mold to said turntable, and wherein said mold comprises:

a mold member defining a thin mold cavity having a cavity bottom and cavity sidewalls dimensioned to receive a metal pan in a slip fit manner, said mold member further defining a generally centrally positioned sprue aperture;

a magnetic sheet disposed against said cavity bottom and defining a central aperture aligned with said sprue aperture, said sheet dimensioned and disposed to engage a planar bottom of the metal pan;

another mold member having a planar top surface facing said mold cavity; and

mold clamp means engaging said first and second members for clamping said members together.

4,639,205

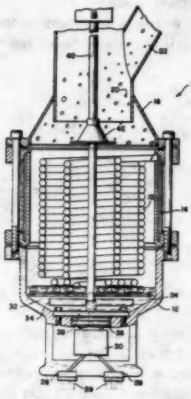
PUMP SHAFT STIRRER FOR GRID MELTER

Hyun S. Lim, Martinsville, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 31, 1984, Ser. No. 636,254
Int. Cl.[4] B29B 13/02
U.S. Cl. 425—200 1 Claim

1. In an apparatus for melting particulate polymeric material including a melting grid, said grid having a center and a sidewall, a source of particulate material located above melting grid, a collecting chamber for the molten polymer placed beneath the grid and a rotatably driven central shaft coaxial with the collecting chamber and te melting grid, said shaft extending above said source, the improvement of an apparatus for distributing said particulate material away from the center to the sidewalls of the grid comprising: a cone fastened to said

shaft at a location below said source and above said melting grid, said cone having an apex directed upward toward said



source and a base, said base having an opposed pair of blades offset from each other extending from a periphery of the base.

4,639,206

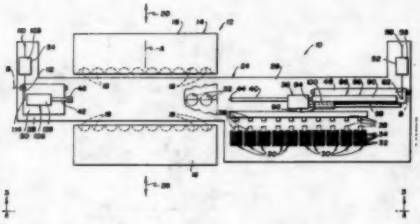
IN-MOLD LABEL DISPENSER FOR BLOW MOLDING

Richard C. Darr, Seville, Ohio, assignor to Plastipak Packaging, Inc., Plymouth, Mich.

Filed Oct. 16, 1985, Ser. No. 787,913

Int. Cl.[4] B29C *49/24*

U.S. Cl. 425—503 **16 Claims**



1. An in-mold label dispenser for a plastic blow molding machine, said blow molding machine including a mold having a pair of mold sections each of which includes a cavity section, and said mold sections being movable toward and away from each other between an open position spaced from each other and a closed position where the cavity sections thereof cooperate to define an enclosed cavity in which blow molding is performed, the in-mold label dispenser comprising: a base having first and second portions located on opposite sides of the mold; a label magazine mounted on the first base portion on one side of the mold; a dispensing head mounted on the first base portion for movement between a withdrawn position adjacent the label magazine and an inserted position between the open mold sections; a label carrier on the dispensing head for receiving a label from the label magazine with the dispensing head in the withdrawn position and for transferring the label to the cavity section of one mold section with the dispensing head in the inserted position between the open mold sections; a first locator on the dispensing head; and a second locator that is mounted on the second base portion, said second locator being engaged with the first locator upon movement of the dispensing head to the inserted position to cooperate in locating the dispensing head and label carrier thereof with respect to the open mold to provide accuracy in aligning the label with respect to the cavity section that receives the label.

4,639,207

IN-MOLD LABEL DISPENSER FOR BLOW MOLDING MACHINE

William A. Slat, Brooklyn, Mich.; Richard C. Darr, Seville, Ohio; Richard L. Dunlap, Cairo, Ohio, and Craig A. Larson, Westfield Court, Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.

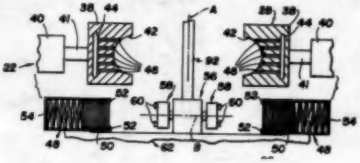
Division of Ser. No. 447,872, Dec. 8, 1982, Pat. No. 4,479,770.

This application Jul. 27, 1984, Ser. No. 635,118

The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.

Int. Cl.[4] B29C *49/24, 49/04*

U.S. Cl. 425—503 **12 Claims**

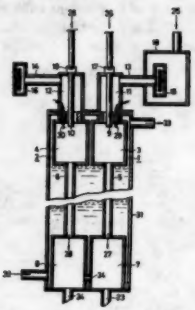


1. An in-mold label dispenser for a blow molding machine including at least one mold having mold sections movable between open and closed positions, and the mold sections including cavity sections which cooperatively define a cavity in which the blow molding is performed with the mold sections in the closed position and which permit ejection of a molded part in the open position, the label dispenser comprising: a label magazine for storing labels; a base; a dispensing head mounted on the base for movement along a first path from adjacent the label magazine to between the mold sections of the mold in the open position; a label carrier mounted on the dispensing head for movement along a second path transverse to the first path between retracted and extended positions; and a dispensing head and label carrier drive mechanism, said drive mechanism having an input that is mounted on the base and driven in association with the movement of the mold of the blow molding machine, said drive mechanism including a first solid mechanical drive that extends from the base to the dispensing head, said first solid mechanical drive having an input driven by the input of the drive mechanism to move the dispensing head in association with the movement of the mold, said drive mechanism also including a second solid mechanical drive that extends from the base to the label carrier, said second solid mechanical drive having an input driven by the input of the drive mechanism to move the label carrier in association with the movement of the mold, and said drive mechanism through the input thereof driving the inputs of the first and second solid mechanical drives actuating movement of the dispensing head and label carrier in association with the movement of the mold during a cyclical operation that: (a) initially moves the label carrier from the retracted position to the extended position with the dispensing head adjacent the label magazine such that the label carrier receives a label from the magazine, (b) thereafter moves the label carrier to the retracted position with the label thereon and also moves the dispensing head to between the mold sections of the mold in the open position, (c) subsequently moves the label carrier to the extended position to deposit the label on one of the mold sections within the cavity section thereof, and (d) finally moves the label carrier back to the retracted position and moves the dispensing head from between the mold sections back to adjacent the label magazine in preparation for the next cycle.

4,639,208
PULSE COMBUSTION APPARATUS WITH A PLURALITY OF PULSE BURNERS

Isao Inui; Masato Hosaka, both of Osaka; Mitsuyoshi Nakamoto, and Kenji Okamoto, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 1, 1985, Ser. No. 718,452
Claims priority, application Japan, Apr. 3, 1984, 59-66073; Apr. 3, 1984, 59-66074; Apr. 3, 1984, 59-66075; Apr. 3, 1984, 59-66076; Apr. 9, 1984, 59-70284; Aug. 18, 1984, 59-171919
Int. Cl.[4] F23C *11/04*
U.S. Cl. 431—1 24 Claims



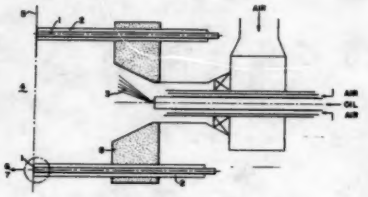
1. A pulse combustion apparatus, comprising:
(a) a fuel supply means;
(b) air supply means;
(c) a plurality of pulse burners coupled with said fuel supply means and said air supply means, each of said pulse burners having a combustion chamber, and an exhaust passage including a tail pipe communicating, at one end thereof, with said combustion chamber, and a cushion chamber communicating with said tail pipe at the other end of said tail pipe; and
(d) means for establishing communication between said exhaust passages of said plurality of pulse burners, the communication establishing means having a passage whose cross-sectional area is within a predetermined range having an upper limit which is smaller than the cross-sectional area of any tail pipe.

4,639,209
METHOD OF SPRAYING ADDITIVES IN AN INTENSIVELY MIXING MANNER INTO A COMBUSTION CHAMBER FOR BINDING SULFUR

Klaus Grethe, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 724,195
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441726
Int. Cl.[4] F23J *7/00*
U.S. Cl. 431—4 7 Claims

1. A method of spraying additives, in such a way that an intensive mixing occurs, into a combustion chamber for binding sulfur contained in combustion gases produced during the combustion of fuels which contain sulfur; said method comprising the steps of:
spraying the respectively utilized additive into said combustion chamber, with at least one spray nozzle, at a momentum which is sufficient to intensively mix said additive with said combustion gases;
utilizing, for said spraying, at least one spray nozzle having at least critical discharge;
spraying said additive into those regions of said combustion chamber which have temperatures in the optimum effective range of said additive for binding said sulfur, yet in which the mixing energy of said combustion gases does not alone ensure a sufficient mixing of said additive with said combustion gases; and
utilizing as a spray nozzle a two-component nozzle, with said additive, together with a small quantity of air as

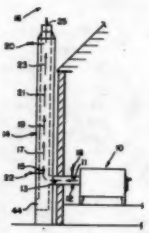


carrier medium, being discharged from said nozzle at a low velocity, and with a spraying medium being discharged from a further nozzle opening of said nozzle at at least critical discharge to draw both said additive and said combustion gases, which surround the nozzle stream, into the mixture pattern of the nozzle stream cone.

4,639,210
PROCESS FOR MONITORING THE HEAT GRADIENT IN A HEAT-PRODUCING SYSTEM

Licio Penaisi, R.D. 1, Box 99, Alfred Station, N.Y. 14803

Filed Mar. 31, 1986, Ser. No. 845,968
Int. Cl.[4] F23D *5/12*
U.S. Cl. 431—13 20 Claims



1. A process for monitoring the heat gradient in a system comprised of a heat source which produces exhaust gas, and means for venting said exhaust gas from the heat source to the atmosphere, wherein said process comprises the steps of:
(a) providing at least three heat sensors wherein, for any given temperature, each of said heat sensors has an output which is substantially identical to the outputs of each of the other heat sensors;
(b) disposing each of said heat sensors downstream of said heat source at different points along the path of said exhaust gas in sequential relationship with each other;
(c) providing means for determining, for each two sequential heat sensors, whether the temperature reported by the downstream heat sensor is lower than the temperature reported by the upstream heat sensor;
(d) providing switching means for activating an alarm whenever the temperature reported by a downstream heat sensor is lower than the temperature reported by an upstream heat sensor;
(e) providing an alarm which is operatively connected to said switching means;
(f) operatively connecting each two sequential heat sensors with said means for determining whether the temperature

reported by said downstream heat sensor is lower than the temperature reported by said upstream heat sensor; and

(g) operatively connecting said means for determining whether the temperature reported by the downstream heat sensor is lower than the temperature reported by the upstream heat sensor with said switching means;

whereby, whenever any downstream heat sensor reports a temperature which is higher than that temperature reported by the heat sensor which is upstream of it, an alarm is activated.

4,639,211

DEODORIZING DEVICE FOR OIL STOVE

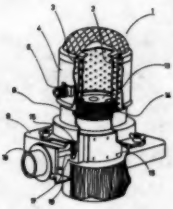
Kenji Akita, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 655,639, Sep. 28, 1984, abandoned. This application May 14, 1986, Ser. No. 863,021

Claims priority, application Japan, Oct. 4, 1983, 58-186172

Int. Cl.[4] F23N *3/00*

U.S. Cl. 431—20 **4 Claims**



1. A movable wick type oil stove containing an outer wick cylinder means and an inner wick cylinder means, said outer and inner cylinders defining a space therebetween;

wick means for absorbing oil and creating a fire at the top thereof, said wick means being disposed within said space formed between said cylinder means;

means for moving the wick means in the vertical direction along the cylinder means; and

deodorizing means operatively associated with the wick means for absorbing or removing gas and the associated smell produced when the fire at the top of the wick means is extinguished by lowering the wick to a predetermined position, said deodorizing means including suction means, and movement-sensing means for sensing the movement of the wick means, and temperature-sensing means for sensing the temperature in the vicinity of the wick means, said movement-sensing means and temperature sensing means being operatively connected with the suction means whereby in response to the lowering of the wick, the suction means is actuated if the temperature sensed by the temperature sensing means does not fall below a predetermined value.

4,639,212

SWIRLING DEVICE FOR STIRLING CYCLE ENGINES

Tetsumi Watanabe, Okazaki; Akira Yamaguro, Anjyo, and Susumu Yamaguchi, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

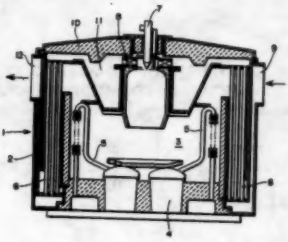
Filed Dec. 7, 1984, Ser. No. 679,453

Claims priority, application Japan, Dec. 9, 1983, 58-189271[U]

Int. Cl.[4] F23M *9/00*

U.S. Cl. 431—183 **1 Claim**

1. A burner for a stirling cycle engine which includes air inlet port means, exhaust port means and combustion chamber means between said inlet port means and said exhaust port means, said combustion chamber means having inlet means provided with swirl producing means including a pair of spaced apart, substantially parallel plates, each of said plates being formed with a central aperture, said apertures having centers and being substantially aligned with each other, a plurality of spiral guide vanes disposed between said plates, each of said guide vanes having a curvature in which a tangent line at any point on said guide vane makes an angle with a straight line passing through said point and said center of the central aperture, said angle being substantially constant and being between 60° and 70°, each two adjacent guide vanes



defining an inlet passage which is gradually decreased in area toward the central aperture, said inlet passage being communicated at an end adjacent to said central apertures with said combustion chamber means and at the other end with said inlet port means, said central apertures defining a swirl chamber, said burner including fuel injection means located in said swirl chamber, whereby mixing of fuel and air in said swirl chamber is enhanced.

4,639,213

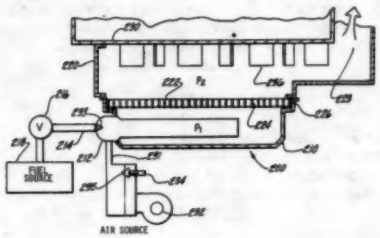
CONFINED SPACED INFRARED BURNER SYSTEM AND METHOD OF OPERATION

Thomas W. Simpson, Rochester, Mich., assignor to Solaronics, Inc., Rochester, Mich.

Filed Dec. 17, 1984, Ser. No. 682,538

Int. Cl.[4] F23D *13/12*

U.S. Cl. 431—326 **9 Claims**



1. A gas-fired infrared heating device comprising:

a burner plenum;

an air-gas mixer means for introducing a combustible air/gas mixture into the plenum at a pressure P1 which is greater than ambient pressure, said mixer means comprising first means for controlling gas flow, second means for providing air flow at above ambient pressure and third means for controlling air flow into the mixer means;

an enclosed but remote vented combustion chamber in which a back pressure P2 prevails, where P1 is greater than P2;

a thick, ceramic burner tile having a sufficient thickness to produce both a pressure and a temperature gradient,

forming a sealed boundary between the plenum and the combustion chamber and having opposite faces thereof addressing the chamber and plenum respectively, the tile having formed therein a plurality a small diameter parallel channels extending between said faces and possessing a

sufficient thickness to produce both pressure and temperature gradients between the faces thereof;

said first and third means being set such that the difference between P1 and P2 results in ignition and stoichiometric combustion of the air/gas mixture flowing from the plenum to the chamber via the channels substantially at the face of the tile which addresses the chamber;

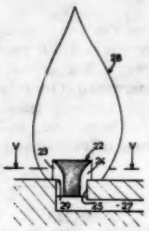
whereby heating the tile to infrared emitting temperature occurs.

4,639,214

LIQUEFIED GAS LIGHTER WITH FLAT FLAME WIDENED IN ITS MEDIAN PART

Jean-Philippe Ainoz, Faverges, France, assignor to S.T.Dupont, Paris, France

Filed Oct. 1f, 1985, Ser. No. 786,271
Claims priority, application France, Oct. 31, 1984, 84 16703
Int. Cl.[4] F23D *14/28*
U.S. Cl. 431—344 **5 Claims**



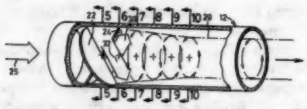
1. A gas lighter of the type having a body including a burner nozzle means, the burner nozzle means including only two, relatively closely spaced gas outlets having upper and lower surfaces, said outlets being formed in a common plane and directed in opposite directions, said lower surfaces terminating in downstream directions extending in a common plane and said upper surfaces extending away from the plane of said lower surfaces whereby flame from the gas outlets combines to form a flat flame widened at its median part.

4,639,215

GAS BURNER

Richard J. Armstrong, Toronto, Canada, assignor to Bernard Marks and Company Limited, Toronto, Canada

Continuation-in-part of Ser. No. 117,383, Feb. 1, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,272
Int. Cl.[4] F23D *14/62*
U.S. Cl. 431—354 **4 Claims**



1. A burner for combustible gases comprises:

a duct for the flow of pressurized combustible mixture;

a vortex sheet generator mounted in said duct;

said vortex sheet generator having two baffles, each baffle defining a separate path through the generator adapted to conduct substantially equal portions of the total flow of combustion gas through the generator;

each of said baffles inclining in an opposite direction longitudinally of the duct and having a straight vortex sheet edge;

the vortex sheet edge of the two baffles meeting in the central area of the duct to make a V-configuration opening in the downstream direction of the duct;

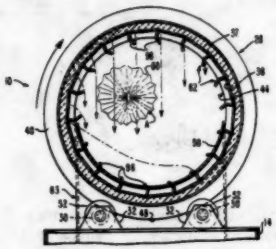
the vortex sheet edges of the two baffles being contained in a common plane that extends along the longitudinal axis of the duct, whereby gas from each path through said generator emerging past its respective vortex sheet edge interfaces with gas from the other path emerging from its respective vortex sheet edge in an opposed direction to form a vortex sheet by viscous shear that is attached to and downstream of said vortex sheet edges and that developes into a vortex tube still further downstream of the vortex sheet edges.

4,639,216

GRAIN ROASTING MACHINE AND METHOD

Dale L. Schnupp, Lebanon, Pa., assignor to Schnupp's Grain Roasting, Inc., Lebanon, Pa.

Continuation of Ser. No. 727,310, Apr. 25, 1985, abandoned. This application Mar. 13, 1986, Ser. No. 840,976
Int. Cl.[4] F27B *7/14*
U.S. Cl. 432—105 **3 Claims**



1. In a method of roasting grain, the combination comprising the steps of:

(a) rotating an elongated hollow roasting drum about its longitudinally-extending central axis;

(b) directing a roasting flame into said drum in a longitudinal direction extending from a front end toward an opposite rear end of said drum, generally parallel to, but offset to one side of, said central axis of said drum such that said roasting flame is located in a nine o'clock to twelve o'clock sector of the drum relative to its direction of rotation;

(c) delivering grain in said longitudinal direction into said drum at said front end thereof but offset to the opposite other side of said central axis of said rotating drum;

(d) conveying grain within said drum by carrying said grain along a first generally arcuate path being displaced from the periphery of said roasting flame and then dropping said grain along a second generally linear path in which most of said grain falls across said drum at said one side of said drum central axis and directly through said roasting flame, returning to said first path, and by concurrently moving said grain from said front end toward said rear end of said drum as it is carried and dropped through said respective first and second paths, as said drum is rotated about is central axis, said first arcuate path beginning at an approximately six o'clock position in the direction of rotation of said drum and extending through an approximately twelve o'clock position but with grain starting to drop from said path as it reaches an approximately nine o'clock position therealong and substantially completing dropping upon reaching an approximately twelve o'clock position such that substantially all of the grain is dropped from said path through said roasting flame being located substantially in the nine o'clock to twelve sector of the drum relative to its direction of rotation; and

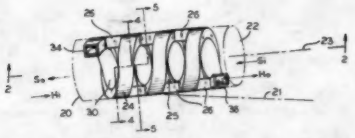
(e) discharging roasted grain from said drum through said rear end thereof as said drum is rotated.

4,639,217

COUNTERCURRENT HEAT TRANSFER DEVICE FOR SOLID PARTICLE STREAMS

D. Carlos Adams, 25 W. 280 High View Dr., Naperville, Ill. 60540

Filed Jan. 14, 1985, Ser. No. 691,494
Int. Cl.[4] F27B 7/08, 7/10
U.S. Cl. 432—107 **20 Claims**



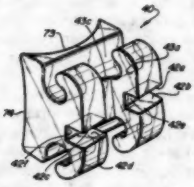
1. A rotating kiln comprising an elongated hollow vessel defining an outer container through which a first stream of solid particle material moves, a fluted interfacing shell with major and minor diameters providing a high surface-to-volume ratio, assembled inside of said hollow vessel wherein a second stream of solid particle material moves through said fluted interfacing shell counter-current to, and without mixing with, the first particle stream, a susbtantial amount of heat being transferred between the two streams and through the interfacing wall formed by said fluted interfacing shell, at least one of said strams of material being moved by means of an Archimedes screw action and means for mounting said kiln for rotation about a centre axis of rotation, each of said streams moving through the kiln responsive to the rotation of said kiln.

4,639,218

CRYSTALLINE ALUMINA ORTHODONTIC BRACKET

Robin M. F. Jones, Titusville; Robert D. DeLuca, Pennington, and Carlino Panzera, Belle Mead, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Continuation-in-part of Ser. No. 602,876, Apr. 23, 1984, abandoned, and a continuation-in-part of Ser. No. 707,281, Mar. 6, 1985, abandoned. This application Jun. 12, 1985, Ser. No. 743,851
Int. Cl.[4] A61C 7/00
U.S. Cl. 433—8 **24 Claims**



1. An orthodontic bracket comprising a base member for attaching to a tooth and a body member extending from the base member, said body member including walls defining an archwire groove, wherein said walls comprise crystalline alumina.

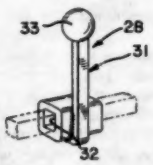
4,639,219

SURGICAL BALL HOOKS

William P. Gagin, Sheboygan, Wis., assignor to American Orthodontics Corporation, Sheboygan, Wis.

Filed Feb. 22, 1982, Ser. No. 351,278
Int. Cl.[4] A61C 7/00
U.S. Cl. 433—22 **3 Claims**

1. An intermaxillary fixation appliance system for securing the jaws of a patient together with the teeth in proper occlusion comprising, edgewise brackets mounted on the upper and lower teeth, said brackets having horizontally rectangular archwire slots, rectangular archwire secured in said slots, a plurality of surgical ball hook appliances mounted on said archwires in opposed relation, each ball hook appliance including a tubular rectangular in cross section base having a rectangular opening therethrough for slidable movement on said archwire to any position between adjacent teeth and brackets, the mating relation between the opening and the archwire preventing rotation therebetween, said base having a length such that it can easily fit between brackets mounted on closely



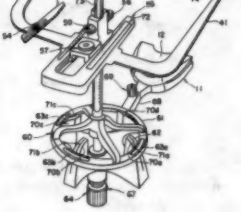
adjacent teeth, an elongated rectangular bar disposed perpendicular to said opening and along adjacent side and bottom walls of said base and extending gingivally of said base to coact therewith and define a hook, means securing the bar to said base, said base being mountable on said archwire so that the bar may be disposed on the labiobuccal or lingual side wall of said base, and a ball-shaped member at the end of said bar having a diameter greater than the maximum cross sectional dimension of the bar, and ligatures extending over said opposed ball hook appliances to fix the jaws together.

4,639,220

APPARATUS FOR DETERMINING THE THREE-DIMENSIONAL POSITION AND ATTITUDE

Toshio Nara, Odawara; Sumiya Hobo, Tokyo; Masao Kashiwada, Ebina; Motoyuki Totsuka, Atsugi; Takao Hoshiai, Tokyo; Katsutoshi Umetani, Hiratsuka; Keisuke Akamatsu, Isehara; Tomohide Inada, Yamato, and Hisao Takayama, Tokyo, all of Japan, assignors to Nippon Avionics Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 555,976
Claims priority, application Japan, Nov. 29, 1982, 57-209077
Int. Cl.[4] A61C 19/04
U.S. Cl. 433—69 **2 Claims**



1. An apparatus for measuring the three-dimensional position and attitude of upper and lower clutches mounted on a patient's teeth, said apparatus comprising:

(a) a face-bow;

(b) a pair of pins movably mounted on said face-bow in position to contact a patient's condyles;

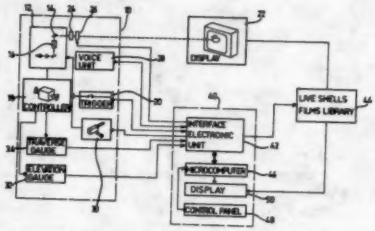
(c) an occlusal pointer movably mounted on said face-bow in position to indicate the position of the patient's margo infraorbitalis;

(d) a mounting shaft mounted on said face-bow and extending vertically thereto, said mounting shaft being movable relative to said face-bow both toward and away from the patient's face and vertically up and down;
(e) first means for locking said mounting shaft in a horizontal position relative to said face-bow;
(f) second means for locking said mounting shaft in a vertical position relative to said face-bow;
(g) an attitude measuring sphere mounted on the lower end of said mounting shaft, said attitude measuring sphere comprising:
(i) a ring that is perpendicular to and coaxial with said mounting shaft;
(ii) a plurality of calibrated scales marked on said ring;
(iii) an indicator mounted on said mounting shaft for vertical movement relative thereto;
(iv) a plurality of claws mounted on said indicator, each one of said plurality of claws having a part-spherical surface that makes surface contact with a corresponding part-spherical surface on said ring and having a line thereon that cooperates with a corresponding one of said plurality of calibrated scales marked on said ring; and
(v) third means for biasing said plurality of claws into surface contact with said ring; and
(h) fourth means for rigidly connecting upper and lower clutches mounted on the patient's teeth to said indicator.

4,639,221
TOOTH CLAMP
Michihiko Sairenji, 14-9, Hatanodai 3-chome, Shinagawa-ku, Tokyo, Japan
Filed Aug. 27, 1985, Ser. No. 769,736
Claims priority, application Japan, Dec. 18, 1984, 59-191818[U]
Int. Cl.[4] A61C 5/12
U.S. Cl. 433—139 **5 Claims**

1. A tooth clamp for use on a tooth surrounded by a gum and having a given height and a top comprising:
(a) a resilient arcuate bridge;
(b) a plurality of gripping plates interconnected by said resilient arcuate bridge;
(c) a mount positioned on at least one of said gripping plates; and
(d) a stopper means, mounted on said mount, for engaging with the tooth along a predetermined extent of the given height of the tooth to prevent said gripping plates from moving into biting engagement with said gum and having means for adjusting a point of engagement along said given height of the tooth.

4,639,222
GUNNERY TRAINING APPARATUS
Yoram Vishlizky, Haifa, Israel, assignor to State of Israel, Ministry of Defense, Armament, Haifa, Israel
Filed Aug. 9, 1983, Ser. No. 521,718
Claims priority, application Israel, Aug. 9, 1982, 66497
Int. Cl.[4] F41F 27/00
U.S. Cl. 434—20 **12 Claims**

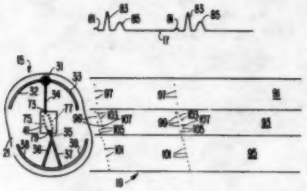


1. A fully recorded image gunnery training system comprising:
a fire control unit located at a trainee location and including:
an aiming sight;
an aiming controller operative to control the orientation of an actual or simulated gun; and
a trigger;
a display viewable through said aiming sight and providing a field of view of a simulated target through said aiming sight corresponding to the actual view of an actual target through the aiming sight of an actual gun;
means for sensing the orientation of said gun produced by operation of said aiming controller by a trainee;
means for determining the trajectory of a simulated projectile relative to said simulated target in accordance with the orientation produced by operation of said aiming controller by said trainee;
means to store a plurality of video records of actual recorded projectile firings said storing means including a video disc library having video records each of about 3–8 seconds duration and including the continuous dynamic effects in the trajectory as would be seen from the location of said actual gun with projectile impact and accompanying sounds for various orientations of said actual gun relative to said actual target corresponding to said simulated target shown on said display means for accessing said video disc library to display said video to the user; and
means responsive to operation of said trigger and to an output from said determining means for selecting a video record from said library and displaying it on said display in a time relationship to trigger actuation by the trainee which corresponds generally to the time relationship between trigger actuation and the displayed events in actual firing.

4,639,223
SIMULATED HEART DISPLAY SYSTEM
J. Walter Keller, Jr., 8600 SW. 54th Ave., Miami, Fla. 33143
Filed Jan. 2, 1985, Ser. No. 688,194
Int. Cl.[4] G09B 23/28
U.S. Cl. 434—272 **23 Claims**

1. A heart display system comprising computer means including means to define an electrophysiological network of conduction pathways in a selected pattern corresponding to a specific type of heart, means to store and monitor the electrophysiological state of the component parts of said pathways, and means to determine the travel of depolarization waves that occur in said pathways from the pattern of said pathways and by the electrophysiological state of said component parts and

in response to predetermined parameters, to thereby simulate the electrophysiological operation of a beating heart, and



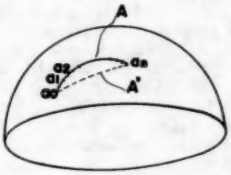
means to display a representation of the operation of said heart in accordance with the travel of said waves of depolarization in said pathways.

4,639,224

MULTIPLE PROJECTOR PLANETARIUM DRIVE SYSTEM

Takeshi Maejima, Toyokawa, and Kenji Shiba, Toyohashi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1985, Ser. No. 727,651
Claims priority, application Japan, Apr. 30, 1984, 59-86949
Int. Cl.⁴ G09B *27/00*
U.S. Cl. 434—286 **13 Claims**



1. A planetarium having a star field first projector for the fixed stars and a plurality of second projectors for the planets or the like which are separated from the star field projector and are each driven by two motors for effecting the combined motions of two axes, comprising;

means for controlling the motion of each second projector in accordance with two modes which in the first mode the second projector is moved so as to trace the actual motion of the planet or the like and in the second mode the second projector is moved from the start position to the target position through the shortest route unrelated to the actual motion of the planet or the like whereby a position of the planet or the like to be projected is rapidly changed.

4,639,225

PORTABLE AUDIO-VISUAL ELECTRONIC APPARATUS

Isamu Washizuka, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1983, Ser. No. 506,761
Claims priority, application Japan, Jun. 24, 1982, 57-110167
Int. Cl.⁴ G09B *5/06*
U.S. Cl. 434—308 **6 Claims**

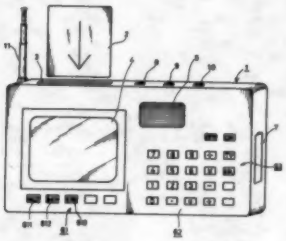
1. A portable audio-visual electronic apparatus having at least three operational modes, including a first mode displaying still display information, a second made displaying a moving picture from still display information and a third mode displaying television signals, comprising

(a) means for visually displaying information including screen display means composed of a matrix of display elements;

(b) a semiconductor memory card for storing a sequence of distinct screens of still display information;

(c) a housing in which said screen display means is disposed and inlet lot in which said semiconductor memory card may be inserted;

(d) display control means in said housing for sequentially displaying said screens of still display information stored on said memory card on said screen display means after the memory card is inserted into said housing via said inlet slot when the apparatus is in the first mode, said display control means being capable of automatically sequencing



said still display information in rapid succession to create the appearance of moving pictures on said screen display means when the apparatus is in the second mode;

(e) receiver means in said housing for receiving T.V. broadcast signals and outputting video signals; and

(f) mode selection means including a T.V. selection key for selecting video signals from said received means when the apparatus is in the third mode;

said display control means, in response to the actuation of said T.V. selection key, displaying said video signals on said screen display means rather than said still display information.

4,639,226

ADULT/CHILD COMMUNICATION KIT

Melanie H. Rahn, and Jane E. Braun, both of Chandler, Ariz., assignors to Dorothy Laporte, Phoenix, Ariz., a part interest

Continuation of Ser. No. 624,472, Jun. 25, 1984, Pat. No. 4,556,390. This application Jul. 15, 1985, Ser. No. 754,950
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.⁴ G09B *29/00*; B42D *15/00*
U.S. Cl. 434—433 **7 Claims**

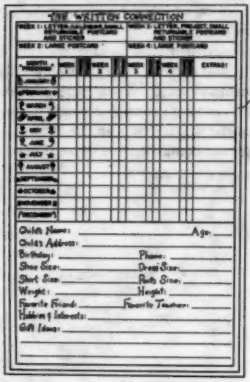
1. A communication kit for organizing and encouraging postal communication between a first person and a second person, said kit comprising:

a. a set of items of stationery to be sent at periodic intervals by said first person to said second person, including,

i. a first item of stationery to be sent at a first selected time, and

ii. a second item of stationery to be sent at a second selected time,

said second selected time being later then said first selected time; and



b. a returnable item of stationery to accompany at least one of said set of stationery items, said returnable item to be returned by said second person to said first person.

4,639,227

BUOY

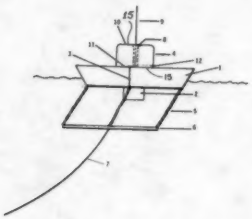
Petrus J. Rademakers, Aerdenhout, Netherlands, assignor to Datawell B.V.

Filed Jan. 11, 1982, Ser. No. 338,628

Claims priority, application Netherlands, Jan. 15, 1981, 8100166

Int. Cl.[4] B63B *22/18*

U.S. Cl. 441—1 **7 Claims**



1. Buoy having a mainly circular horizontal cross-section with a diameter which is greater than the height of the buoy and a shape and weight distribution for following the angular movement of the water surface and for measuring wave slopes, said buoy having a disc shaped mainly circular main float body with a generally flat lower surface in contact with the water and with a horizontal upper surface, in which on the said upper surface an auxiliary mainly circular float body is mounted, said auxiliary float body being concentric with the said cross-section but having a smaller diameter, said auxiliary float body having further sufficient buoyancy for restoring the normal right-up position after upside down reverse by violent water and air movements, said auxiliary float body still further having a shape, horizontal dimension and height such that the tilting moment exerted by wind forces on sid auxiliary float body is compensated by the pressure distribution caused by said auxiliary float body on the said upper surface.

4,639,228

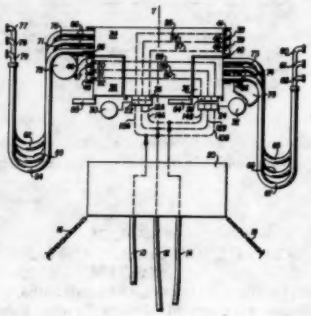
ROTATING MULTI-PATH FLUID MANIFOLD

Roland E. Bulow, Stamford, Conn., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,563

Int. Cl.[4] B63B *21/52*

U.S. Cl. 441—5 **17 Claims**



16. A method of continuously withdrawing fluids from at least a fixed riser conduit into a vessel which is free to rotate in a plane, comprising the steps of:

dividing said at least a fixed riser conduit into a plurality of flowpaths, each flowpath ending in a separate connector;

positioning a plurality of drums, each drum including a connector and rotatable in said plane, over said flowpath connectors, each of said drums capable of being flexibly connected to said vessel and rotatable during connection with respect to said vessel through a connecting arc, where the sum of said plurality of connecting arcs is greater than 360°, with the connecting arc for one drum overlapping the connecting arc of an adjacent drum at both ends of said one drum connecting arc;

establishing a flowpath through connectors to respective drums and said vessel when said vessel is positioned within said respective connecting arc and disconnecting the connector associated with any drum prior to angular movement of said any drum outside its connection arc; and

repositioning of said any disconnected drum and its associated connector in order that it may be reconnected with its connecting arc.

4,639,229

SURVIVAL KIT AIR DEPLOYABLE APPARATUS AND METHOD

David A. Wright, and David B. Webb, both of Fort Erie, Canada, assignors to Her Majesty the Queen in right of Canada, Canada

Filed Feb. 20, 1985, Ser. No. 703,530

Claims priority, application Canada, Apr. 5, 1984, 451376

Int. Cl.[4] B63C *9/04*

U.S. Cl. 441—42 **20 Claims**

1. An air deployable survival kit apparatus comprising:

(a) an outer, rigid container shell having an aerodynamic design to enable its being dropped from an airplane, the shell including a hollow body, a nose cone secured thereto and a tail cone releasably secured thereto;

(b) means attached to the shell to release the tail cone from secured position on the body of the container shell after deployment;

(c) individual survival kit elements packaged within the shell to be released through the tail cone end thereof when opened, the elements being packaged within the shell body in a predetermined manner as follows:

(i) a first survival kit package comprising a first deflated, inflatable life raft, inflation means therefor actuable a predetermined time after the first survival kit package has left the shell body, package means releasably enveloping the life raft and inflation means and an aerodynamic brake means secured to the package means to slow the vertical descent of the first survival kit package when it has left the shell body after air deployment of the survival kit apparatus, the first survival kit package being normally positioned within the shell body at its end adjacent the tail cone;

(ii) a second survival kit package comprising a second deflated, inflatable life raft, inflation means therefor actuable a predetermined time after the first survival kit package has left the shell body, and package means releasably enveloping the second life raft and inflation means, the second survival kit package being normally positioned within the shell body at its end near the nose cone;

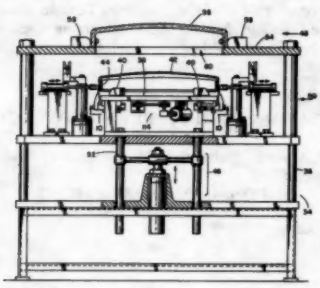
(iii) a rope deployment package normally positioned within the shell body between the first and second survival kit packages, the rope deployment package comprising a coil of buoyant rope of predetermined length, uncoilable from one end, a package means releasably enveloping a major portion of the rope coil, the end of the rope from which the rope coil is uncoiled being secured to the second life raft and the other end of the rope being secured to the first life raft.

4,639,230

APPARATUS AND METHOD FOR SHADOW MASK INSERTION

William H. Meyle, Naperville, and Paul H. Wendt, Northlake, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 25, 1980, Ser. No. 172,330
Int. Cl.[4] H01J *9/00*
U.S. Cl. 445—30 **2 Claims**



1. For use in the manufacture of a color cathode ray picture tube having a substantially rectangular face panel including a rearwardly extending flange with a plurality of inwardly extending studs, and with a shadow mask with frame suspended in precise adjacency to said panel by an equal plurality of leaf-type springs extending from said frame, the distal ends of each of said springs having an aperture for detachably engaging an associated one of said studs and an indent adjacent to said apertures for locking, in conjunction with an associated detent, said apertures at predetermined points, said mask and said panel being subject to dimensional deviations which preclude unequivocal engagement of said apertures with said studs, apparatus for inserting said mask in said panel, comprising:

platen means with mask frame-prelocating means for receiving and approximately locating said mask, convex-sideup, on said platen means;

elevator means for raising and lower said platen means and said mask between an upper assembly position and a lower, pre-assembly position;

table means in said upper assembly position for receiving and approximately locating said panel, convex-sideup, with respect to said mask, said table means having an opening for receiving said platen means in approximate coplanarity when said platen means is raised by said elevator means into said upper assembly position;

means for preparing said mask for engagement with said panel when said platen means and said mask is in said lower pre-assembly position, said means for preparing said mask for engagement including:

tapered pin means for seeking said spring apertures and locating the axes of said apertures in a first, substantially horizontal plane, including means for moving said tapered pin means into and away from engagement with said apertures;

spring depressor means for clamping each of said springs against said mask frame to preserve the location of said axes of said apertures in said first horizontal plane, said spring depressor means including said detents for mating with assigned ones of said indents to lock said apertures at said predetermined points in said first, substantially horizontal plane,

to simultaneously horizontally immobilize said frame,

and to maintain such horizontal immobility during any subsequent translation of said frame;

stud locating means for establishing the studs of said panel in a substantially horizontal second plane in said upper assembly position, said stud-locating means including V-groove tip means for locating, positioning and cradling said studs in said second plane with the axes of said studs in approximate vertical alignment with said predetermined points;

means for actuating said elevator means for raising said mask to said upper assembly position to translate said first and second planes into approximate coplanarity, and bring the axes of said apertures into approximate coincidence with the axes of said studs;

means for releasing said spring depressor means to cause said springs to rest against said V-groove tip means and to permit at least partial engagement of said apertures of said springs with said studs;

means for withdrawing said V-groove tip means to uncradle said studs and effect full engagement of said apertures of said springs with said studs;

such that dimensional deviations of said mask and said panel are nullified by locating and locking the axes of said apertures and positioning and cradling said studs in approximate coaxial coincidence before releasing said spring depressor means to provide positive, consistent and unequivocal mutual engagement of said apertures and said studs.

4,639,231

RETAINER FOR ELECTRICALLY FIRED GETTER

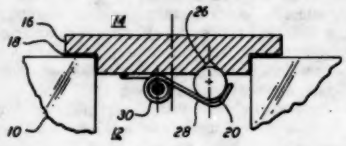
James G. Koper, and Bo H. G. Ljung, both of Wayne, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Sep. 23, 1985, Ser. No. 778,940
Int. Cl.[4] H01S *3/083*
U.S. Cl. 445—31 **7 Claims**

1. In a ring laser gyroscope comprising a block having a cavity therein, an electrically fired getter in the cavity, the getter having a heater coil, feedthroughs for transmitting electrical current from the outside to the inside of the cavity, and wires for connectng the heater coil to the feedthroughts, the improvement comprising means for retaining the getter in a

position substantially stationary with respect to the block, wherein the means for retaining comprises;

a spring having an axis of symmetry and having a coil disposed symmetrically about said axis, said spring having an elongate U-shaped portion with a first arm portion and a second arm portion symmetrically disposed about said axis of symmetry for bearing on said getter, said coil



having a first coil portion fixedly connected to said first arm portion and having a second coil portion fixedly connected to said second arm portion, said first coil portion having a first end portion, and said second coil portion having a second end portion, said end portions being arranged to bear against a wall of said cavity for resisting a twisting moment on said coil; and means for holding the coil against the wall of the cavity.

4,639,232

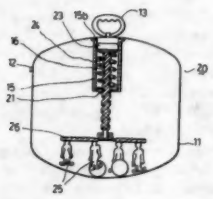
TOY HAVING AN ENVELOPE ENCLOSING A MOVING MECHANISM

Cheng-Chung Wang, 12th Fl., No. 440, Sec. 4, Jen-Ai Rd., Taipei, Taiwan

Filed Mar. 1, 1985, Ser. No. 707,476

Int. Cl.[4] A63H *3/06*

U.S. Cl. 446—220 **11 Claims**



1. A toy comprising:

an envelope having a flexible material wall;

a sheet extending across an interior portion of the envelope and being connected to an inner side of the wall;

a rigid tubular member being centered through the sheet and having an outer periphery;

a transverse plate having a central opening and a cam edge around the opening, said transverse plate being fixed at a top end of the tubular member;

a moving rod mounted in the tubular member and passing through the central opening so as to be axially movable therethrough, said moving rod having an outer periphery, a longitudinal axis, a top end, and a bottom end; and

helical grooves of predetermined length provided on the outer periphery of the moving rod so as to engage with the cam edge around the central opening in the transverse plate.

4,639,233

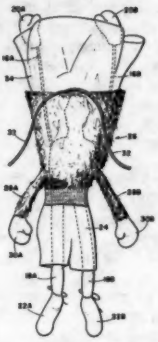
DOLL HAVING MEANS TO CONVERT FROM ONE CHARACTER TO ANOTHER

Brian Brassfield, 2024 A. N. E., Miami, Okla. 74354

Filed Aug. 5, 1985, Ser. No. 761,546

Int. Cl.[4] A63H *3/16, 3/12, 3/20*

U.S. Cl. 446—321 **3 Claims**



1. A doll having means to convert from one character to another, comprising:

a doll body including a torso, legs, feet, a flexible pair of arms and a head portion, the head portion having a face thereon providing a first character;

a loose fitting outer garment received on said body, the garment having an open type lower portion such as a robe, skirt, dress, kilts or the like which does not receive said legs separately;

a first under garment lower portion received on said doll body and receiving both legs thereof;

an invertable skirt-type, flexible member received on said doll lower portion over said first under garment and under said outer garment and having, on the underneath side thereof, elements forming upper body, face, and outer head features, the flexible member being invertable and maintained over said doll body head portion to encompass said head portion, the lower portion of said outer garment being receivable inside the inverted flexible member, the inverted flexible member thereby forming a second head and face of said doll body providing a second character.

4,639,234

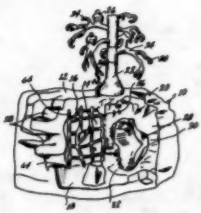
TOY PLAY SET WITH PUPPET FOR TOY ACTION FIGURES

Robert W. Atwood, Whittier, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 4, 1985, Ser. No. 784,147

Int. Cl.[4] A63H *33/00*

U.S. Cl. 446—327 **7 Claims**



1. A toy playset for use with toy action figures comprising means for simulating a cage having a door, means for securing

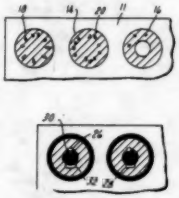
and releasing the door, means for simulating a trap capable of ensnaring a toy action figure, means for simulating a monster guarding the cage, and means for simulating a tree capable of grasping a toy action figure.

4,639,235

ATTACHABLE EYE FOR DOLLS

Rebecca C. Ibe, 39290 Prentiss, Mt. Clemens, Mich. 48045

Filed Mar. 8, 1985, Ser. No. 709,674
Int. Cl.[4] A63H *3/38*; A01N *1/00*; B32B *3/00*
U.S. Cl. 446—389 1 Claim



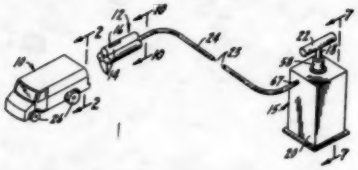
1. The method of making eye simulations for adhesive application to the head of a doll which comprises providing a flexible backing sheet of washable fibrous material, applying a first coating on said entire sheet of a white waterproof material, depositing upon said first coating a plurality of spaced apart circular areas of a waterproof coloring material of a color selected to represent irises of eyes, depositing centrally on each iris-simulating area a circular area of a black waterproof coloring material to simulate the pupil of the eye, applying another coating over said deposits of a transparent waterproof material to provide a gloss over the eye simulations, and finally trimming each eye simulation from the sheet to leave a border of the white backing sheet surrounding each iris-simulating area to represent the white of the eye.

4,639,236

TOY VEHICLE AND LAUNCHER

Robert S. McKay, 7420 Beckwith Rd., Morton Grove, Ill. 60053, and Dennis R. Dahm, Streamwood, Ill., assignors to Robert S. McKay, Wood Dale, Ill.

Filed Feb. 8, 1985, Ser. No. 699,591
Int. Cl.[4] A63H *29/00*
U.S. Cl. 446—430 9 Claims



1. A toy comprising:

(a) a toy vehicle having formed therein an opening at the rear of the vehicle;

(1) a spring positioned within the vehicle and compressible therein;

(b) a launcher comprising a weighted group of simulated dynamite sticks, sized to be received within said opening in said vehicle, the group containing release means for releasable engagement with said vehicle;

(c) actuator means for actuating the release means to engage and hold the group of dynamite sticks within the vehicle and to hold the spring in a compressed position, and to release the same and permit said spring to return to its uncompressed condition;

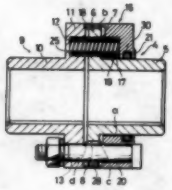
(d) wherein said launcher and actuator means are spaced apart and are connected only by an actuator cable adapted to cause said release means to release said vehicle from said launcher on actuation of said release means.

4,639,237

SHAFT COUPLING WITH PRESS FIT COIL SPRINGS FORMING RESILIENT TORQUE-TRANSMITTING ELEMENTS

Kazuichi Fukuda, Fujisawa, Japan, assignor to Shoyo Engineering Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 526,127, Aug. 24, 1983, abandoned. This application Aug. 19, 1985, Ser. No. 766,683
Claims priority, application Japan, Aug. 26, 1982, 57-146791; Feb. 7, 1983, 58-17420; May 19, 1983, 58-86648
Int. Cl.[4] F16D *3/56*
U.S. Cl. 464—65 15 Claims



1. A shaft coupling structure comprising:

first and second hubs for connection to respective shafts;

said first hub including a cylindrical portion having extending outwardly from one end thereof a flange having spaced around the circumference thereof a plurality of through holes extending entirely through said flange;

said second hub including a cylindrical portion having extending outwardly from one end thereof a flange structure having spaced around the circumference thereof a plurality of closed-end holes;

said hubs being positioned with said flange and said flange structure facing each other with axial clearance therebetween and with said through holes of said first hub aligned with respective said closed-end holes of said second hub;

a holding member including an annular body having therethrough a center opening and spaced therearound a plurality of closed-end holes, said holding member being positioned on the axial side of said flange of said first hub opposite that of said flange structure of said second hub, with said cylindrical portion of said first hub extending through said center opening of said annular body and with said closed-end holes of said annular body aligned with respective said through holes of said first hub;

a plurality of coil springs, each said coil spring being formed by a coiled wire having a rectangular cross section, and each said coil spring being positioned to extend through a respective said through hole of said first hub with opposite axial ends of said coil spring extending into and abutting bottom surfaces of respective said closed-end holes of said second hub and said annular body;

means connecting said annular body of said holding member to said flange structure of said second hub for axially compressing therebetween said coil springs such that the axial length of said compressed coil springs is from 65–80% of the uncompressed length of said coil springs, and thereby for radially enlarging said coil springs and bringing said coil springs into tight, press fitting abutment with inner surfaces of said through holes of said first hub and said closed-end holes of said second hub and said annular body;

said coil springs when uncompressed having outer surfaces spaced from said inner surfaces of said through holes of

said first hub and said closed-end holes of said second hub and said annular body by clearances equal to 0.0005–0.0015 times the outer diameter of said coil springs but not less than 0.02 mm, and said clearances being smaller than the radial increments of said coil spring that occur when the coil spring is axially compressed; and

the diametral outer surface of said coil spring being ground so that said clearances are secured.

4,639,238

VARIABLE SPEED DRIVE PULLEY

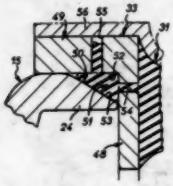
Michel Jaccod, Champigny-sur-Marne, France, assignor to Valeo, Paris, France

Filed Nov. 27, 1985, Ser. No. 802,253

Claims priority, application France, Jul. 12, 1984, 8418696

Int. Cl.[4] F16H *55/56*

U.S. Cl. 474—8 **10 Claims**



1. Variable speed drive pulley comprising a hub, two annular flange plates around said hub in face-to-face relationship, one of which is mobile axially relative to said hub, an annular diaphragm of variable cone angle having a peripheral part forming a Belleville spring washer and a central part divided into radial fingers, a connection piece, an elastic material annular spacer to which said connection piece is attached and through which said Belleville spring washer bears axially on said mobile flange plate, a support piece fixed axially with respect to said hub on which said radial fingers bear, a fluid-tight regulating chamber formed between said mobile flange plate, said diaphragm, said support piece and said hub and adapted to be connected to a source of fluid, and sealing means in one piece with said elastic material spacer disposed between said connection piece and said mobile flange plate.

4,639,239

SPEED CHANGE DEVICE PULLEY WITH A SEAL AROUND THE HUB

Jacques Thirion de Briel, Levallois-Perret, and Michel Jaccod, Champigny-sur-Marne, both of France, assignors to Valeo, Paris, France

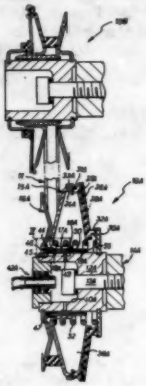
Filed Nov. 13, 1985, Ser. No. 797,526

Claims priority, application France, Nov. 15, 1984, 84 17437

Int. Cl.[4] F16H *55/56*

U.S. Cl. 474—8 **15 Claims**

1. Variable speed drive pulley of the kind comprising a hub which has an internal opening and, in face-to-face relationship to each other around said hub, two annular flanges of which at least one, hereafter referred to for convenience as the mobile flange, is mounted so as to be mobile axially relative to said hub being for this purpose axially fastened to a bush slidably engaged on the latter with, disposed between said bush and said hub, two pads of anti-friction material axially spaced from each other, in association with a spacer, hereinafter referred to for convenience as the abutment space, which is also fastened axially to the mobile flange and adapted to limit its axial displacement in one direction, and in association with a regulating chamber which, adapted to be connected to a source of fluid, is defined at least in part by the mobile flange, the hub and a seal disposed around said hub in line with said abutment spacer and linked to move with said mobile flange, this variable speed drive pulley being characterized, in combination, on the one hand in that the abutment spacer is carried by the end of the bush of the mobile flange directed towards the fixed flange and it features, transversely, a collar which is directed radially towards the axis of the assembly and by virtue of which it delimits, for its part, a housing in which is disposed the associated seal, and, on the other hand, in that for the purpose of



connecting the regulating chamber to a source of fluid there is provided in the bush between the anti-friction material pads at least one passage and, in the hub, also between said anti-friction material pads, for communication between the internal space of the hub and the volume delimited by the anti-friction material pad between it and the bush, at least one passage.

4,639,240

CHAINGUARD

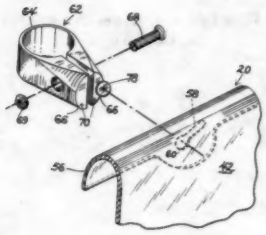
King Liu, Taichung Hsen, Taiwan, assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Nov. 14, 1985, Ser. No. 797,868

Claims priority, application Taiwan, May 1, 1985, 74203323

Int. Cl.[4] B62J *13/00*

U.S. Cl. 474—144 **6 Claims**



1. In a chainguard for a bicycle or the like of the type having a housing including a curved forward end portion adapted to extend at least partially about a front sprocket and a rear end portion adapted to extend along the top run of a bicycle chain and having means for attaching said rear end portion to a bicycle frame adjacent a rear sprocket, the improvement comprising:

said housing having a vertical wall adapted to lie alongside at least one frame tube of a bicycle, said wall having at least one through-slot with an enlarged portion therein;

a clamp adapted to encircle a bicycle frame tube and having opposed adjacent end portions with means for securing them together to grip said frame tube;

said clamp end portions having a pair of coplanar end surfaces adapted to abut said wall around said through-slot, a lug extending forwardly from one of said end surfaces;

said lug including a shank and an enlarged head at the end thereof;

said shank sized to fit within said through-slot and having an axial length at least equivalent to the thickness of the wall; and

said head being larger in diameter than the width of the through-slot and sized to pass through the enlarged portion thereof;

whereby said clamp is positionable in a range of connected positions of said lug along the length of said through-slot to accommodate a range of angular orientations of the bicycle frame tube relative to said chainguard.

4,639,241

FREEWHEEL FOR A CYCLE OR THE LIKE

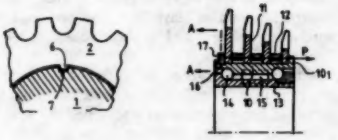
Edouard Monka, Incheville, France, assignor to Etablissements Maurice Maillard, Incheville, France

Filed Oct. 28, 1985, Ser. No. 792,307

Claims priority, application France, Nov. 29, 1984, 84 18219

Int. Cl.⁴ F16H *55/12*

U.S. Cl. 474—902 **3 Claims**



1. A freewheel for a cycle, comprising a hollow body of generally circular shape which receives on its periphery a plurality of regularly spaced gearwheels retained laterally between two flanges, means also being provided for securing the gearwheels to the body in a manner precluding relative rotation, wherein at least one of the flanges comprises an annular part of which the original internal diameter is at least equal to the diameter of the periphery of the body which is accommodated, by permanent deformation, in an annular groove on the periphery of the body.

4,639,242

VESSEL AND PROCEDURE FOR AUTOMATED ASSAY

Arthur L. Babson, Old Mill Rd., Chester, N.J. 07930

Filed Feb. 4, 1985, Ser. No. 698,013

Int. Cl.⁴ B04B *1/00*; B65D *23/00*

U.S. Cl. 494—37 **20 Claims**

1. A vessel of single construction comprising in longitudinal order about a center axis (1) a closed bottom portion; (2) generally cylindrical mid-portion having a predetermined interior diameter somewhat narrower at the bottom-most portion than at the top-most portion of said mid-portion; (3) a chamber portion comprising an outwardly biased lower portion, a generally cylindrical middle portion of greater interior diameter than said mid-portion, and an inwardly biased upper portion; and (4) a neck portion having an interior diameter less than the interior diameter of said chamber middle portion.

4,639,243

PROCESS AND APPARATUS FOR OBTAINING BLOOD PLASMA

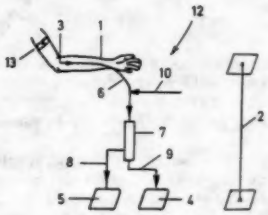
Baerbel Schmidt, Hirsch-Gereuth-Str. 27, D-8000 München 70; Walter Samtleben, Waldpromenade 102½, D-8035 Gauting, both of Fed. Rep. of Germany, and Michael J. Lysaght, 33A Shoreline Rd., Barrington, Ill. 60010

Filed Jan. 17, 1984, Ser. No. 571,399

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302383

Int. Cl.⁴ A61M *1/34*

U.S. Cl. 604—6 **26 Claims**



1. A process of collecting plasma from a donor comprising the steps of

applying external pressure on the heart-side of a selected venous injection site on the donor,

puncturing the injection site with a cannula,

suspending a blood collection reservoir at a predetermined distance below the injection site so as to convey whole blood between the cannula and the blood collection reservoir through a plasma filtration unit to separate the plasma from the whole blood relying only upon the applied external pressure and the force of gravity, and

collecting the separated plasma.

17. An apparatus for collecting plasma from a donor comprising

a cannula inserted in a venous injection site on the donor for withdrawing whole blood while an external pressure is applied on the heart-side of the injection site,

a blood collection reservoir suspended a predetermined distance below said cannula, and,

means for conveying whole blood between said cannula and said blood collection reservoir, said conveying means including

filtration means positioned between said cannula and said reservoir for separating the plasma from the whole blood relying only upon the external pressure and the force of gravity, and

means for collecting the separated plasma.

4,639,244

IMPLANTABLE ELECTROPHORETIC PUMP FOR IONIC DRUGS AND ASSOCIATED METHODS

Nabil I. Rizk, 229 Haymont Dr., Gibsonia, Pa. 15044, and Charles L. Stevens, Pittsburgh, Pa., assignors to Nabil I. Rizk, Gibsonia, Pa.

Continuation of Ser. No. 491,241, May 3, 1983, abandoned. This application Jul. 12, 1985, Ser. No. 754,629

Int. Cl.⁴ A61N *1/30*

U.S. Cl. 604—19 **48 Claims**

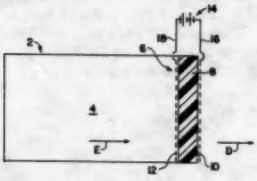
1. An implantable electrophoretic pump for ionic drugs comprising

a housing,

a substantially fixed volume reservoir for storing said ionic drugs having a filler opening and a discharge opening,

said housing having opening means disposed generally adjacent to said filler opening and said discharge opening,

a filler member disposed within said filler opening and being self-sealing and adapted to be pierced by a reservoir filling member and upon removal of said filling member will resist leakage therethrough,



a reservoir discharge member disposed within said discharge opening and having a diffusion membrane and a pair of associated electrodes,

electrical energizing means for energizing said electrodes, and

the polarity of said electrodes being adapted to be connected such that when said electrodes are energized increased flow of said ionic drug through said discharge member will occur as compared with flow induced solely through diffusion when said electrodes are not energized, whereby said pump can deliver said ionic drugs electrophoretically.

4,639,245

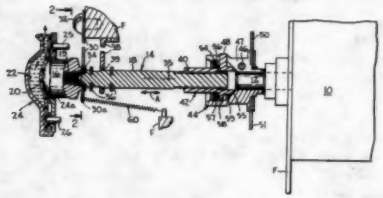
FLUID INFUSION PUMP DRIVER

Giovanni Pastrone, Los Gatos, and Leland D. Chamness, Mountain View, both of Calif., assignors to Oximetrix, Inc., Mountain View, Calif.

Filed Dec. 20, 1985, Ser. No. 811,262

Int. Cl.[4] A61M 5/20

U.S. Cl. 604—152 **14 Claims**



1. An infusion pump driver for pumping liquid from a cassette adapted to be selectively engaged with said driver and having a pumping chamber therein with an exposed wall thereof being formed by a flexible diaphragm, said driver comprising a frame structure, a motor mounted to said frame structure and including a drive shaft, a plunger adapted to engage said diaphragm for pumping liquid from the cassette pumping chamber, said plunger having an axially extending shaft, means for securing the plunger to said frame structure so as to permit movement thereof generally along the axis of the plunger shaft but preventing rotational movement thereof about said shaft axis, and means for coupling the plunger shaft to the drive shaft, said last named means providing a threaded connection between the drive shaft and the plunger shaft wherein rotation of the drive shaft results in movement of the plunger generally along the plunger shaft axis and including a universal joint for permitting relative pivotal movement between said plunger shaft axis and the axis of the drive shaft.

4,639,246

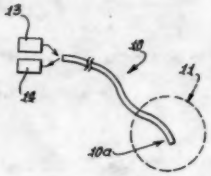
CATHETER

Ralph S. Dudley, Anaheim, Calif., assignor to Animal Healthcare Products, Vernon, Calif.

Filed Sep. 9, 1985, Ser. No. 773,569

Int. Cl.[4] A61M 5/00, 25/00

U.S. Cl. 604—158 **11 Claims**



1. For use with a hollow needle insertible into the trachea of an animal, the improvement comprising

(a) an elongated, flexible plastic tube sized to pass lengthwise through the needle and to be threaded through the needle after its insertion into the animal trachea,

(b) said tube having an end portion adapted to extend into the trachea and at least four side openings in said end portion to deliver fluid to the trachea, and to withdraw fluid therefrom,

(c) said openings spaced at different distances from the terminal of said end portion, said openings being elongated in the direction of the tube, the lengths of said elongated openings being at least as great as the tube diameter, the openings' widths approximately equal to the inner diameter of the tube,

(d) each opening being symmetrical with respect to a tube axial radial plane bisecting that opening, the opening profile, viewed normal to said plane having elongated U-shape, with an elongated base the depth of which is greater than the tubing wall thickness,

(e) the widths of the openings being constant along major lengths of the openings.

4,639,247

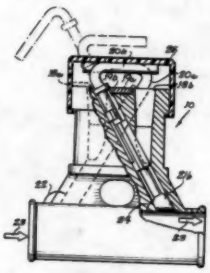
PERCUTANEOUS ACCESS DEVICE

Jack C. Bokros, Austin, Tex., assignor to Carbomedics, Inc., Austin, Tex.

Filed Nov. 2, 1984, Ser. No. 667,581

Int. Cl.[4] A61M 5/32

U.S. Cl. 604—175 **13 Claims**



11. An implantable device comprising

a housing having one end which is implantable in a patient and a second end which extends external of the patient when implanted,

said housing having a substantially rectilinear first passageway of substantially constant cross-section extending

between an opening in said first end of said housing and a first opening in said second end of said housing,

said housing also having a second passageway extending through the housing from a second opening in said second end to a junction with said first passageway located between said openings in said first and second ends so as to provide communication between said first passageway and a region exterior of the body through said second passageway,

a plunger disposed within said first passageway through said first opening comprising a shaft having an irregular cross-section that is smaller then the cross-section of said first passageway and that varies along the length of the plunger and also having sealing means on the distal end thereof which seals with the interior wall of said first passageway throughout substantially the entire length thereof, said housing having means permitting partial axial withdrawal of said plunger so said sealing means is located adjacent the junction of said passageways where there is communication between said first and second openings of said passageways through the junction and past said irregular cross-section shaft, access to said opening in said one end through said second passageway being achieved only upon selective rotation of said plunger in the partially axially withdrawn location and then withdrawal of said plunger and its associated sealing means past the junction between said second passageway and said first passageway, said shaft of said plunger being of such length that, when said plunger is fully inserted into said first passageway, said sealing means extends past said junction but not substantially beyond said opening in the first end.

4,639,248

SYRINGE

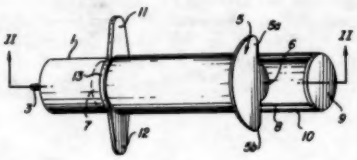
Jean-Denis Schweblin, 4, Place de l'Etrier, 1224 Chene Bougeries, Switzerland

Filed Nov. 22, 1985, Ser. No. 801,057

Claims priority, application Switzerland, Dec. 7, 1984, 5832/84; Jan. 11, 1985, 123/85

Int. Cl.[4] A61M 5/00

U.S. Cl. 604—187 **8 Claims**



1. Syringe for extracting and emptying a liquid comprising:

a cylindrical body provided on its close front end with a needle supporting nozzle, and a piston movable coaxially in said body so that a relative axial movement between the body and the piston will correspond to a variation in the volume of the chamber formed between the front end of the body, its cylindrical wall and the adjacent surface of the piston for sucking or ejecting a liquid through said needle supporting nozzle, wherein the body comprises at its rear end a first bearing surface and that the piston is rigid through its rod, being coaxial and approximately semi-cylindrical cross-section, with a second bearing surface located between the first bearing surface and the front end of said body, so that when the second bearing surface is moved toward the first bearing surface the volume of the inner chamber increases, whereas when said second bearing surface is moved away from the first bearing surface the volume of said chamber decreases, the piston rod comprises a first inner part and a second outer part, being of approximate semi-cylindrical cross-section, connected at their rear end to a terminal part, whereby the inner part is fixed to the piston and the front end of the outer part is fixed to the second bearing surface.

4,639,249

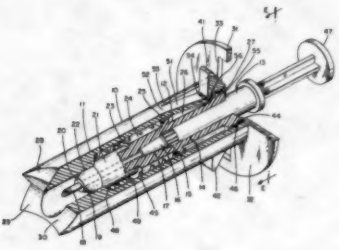
LATCH INTEGRAL WITH LATCHED APPARATUS

Eldon E. Larson, 7500 Seabeck Holly Rd., NW., Bremerton Wash. 98312

Filed Jan. 13, 1986, Ser. No. 818,477

Int. Cl.[4] A61M 5/32

U.S. Cl. 604—198 **8 Claims**



1. An apparatus comprising first and second elements made of resilient material and in sliding contact with each other, said second element being movable in a first direction with respect to said first element and in a second direction opposite to said first direction and having a face surface essentially perpendicular to said first and second directions, latch apparatus comprising:

a rectangular leaf spring integral with said first element and having:

a first side,

a second side,

a first end, and

a second end and

a width W, the distance from said first side to said second side,

said first and second sides being essentially parallel to said first and second directions, said first side being separated from said first element by a first slit having a width w1 and said second side being separated from said first element by a second slit having a width w2,

said second end being separated from said first element by a slit having a width w3,

said first end being integral with said first element and being located a distance L in said first direction from said second end, L being the effective length of said leaf spring and of said first and second slits,

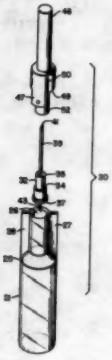
said leaf spring being formed so that said second end is positioned to abut said face surface of said second element, whereby said second element is prevented from moving in said first direction relative to said first element,

means for deflecting said leaf spring to move said second end out of abutment with said face surface, whereby said second element is freed for sliding motion in said first direction relative to said first element.

4,639,250
SYRINGE BARREL AND HYPODERMIC NEEDLE ASSEMBLY

Alan K. Rycroft, Rutherford, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 20, 1986, Ser. No. 831,754
Int. Cl.[4] A61M 5/24
U.S. Cl. 604—201 33 Claims



1. An operable syringe barrel and hypodermic needle assembly comprising:

an elongate barrel portion having an open proximal end and a chamber for retaining fluid;

a tip portion extending from a distal end of said barrel portion having a passageway therethrough;

a projection extending outwardly from said tip portion;

pierceable barrier means for preventing fluid communication between said chamber and said passageway;

a rigid hub having a forward end, a rearward end and a conduit therethrough, said hub movably positioned within said passageway;

a first cannula extending outwardly from said forward end of said hub and a second cannula extending outwardly from said rearward end of said hub, said first cannula and said second cannula being in fluid communication;

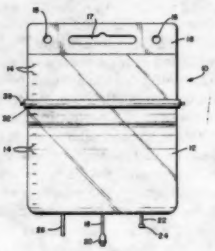
an elongate hollow needle shield slidably engaging said tip covering said first cannula, said needle shield having an outer skirt portion extending over a portion of said tip, said outer skirt portion being capable of contacting said projection for limiting the motion of said needle shield toward the proximal end of said barrel, said outer skirt portion including a longitudinal groove being wider than said projection and capable of receiving said projection; and

said needle shield having an inner skirt portion projecting proximally into said passageway and capable of contacting said hub, said inner skirt portion being long enough so that when said needle shield is rotated to align said groove and said protection, and moved in a proximal direction with respect to said tip portion so that said projection enters said groove, said inner skirt pushes against said hub and moves said hub in a proximal direction causing said second cannula to pierce said pierceable barrier means.

4,639,251
FLEXIBLE COLLAPSIBLE CONTAINER WITH LIQUID LEVEL INDICATING DEVICE

W. Dean Kirkland, Walnut Creek, Calif., assignor to KabiVitrum, Inc., Alameda, Calif.

Filed Jun. 28, 1985, Ser. No. 749,707
Int. Cl.[4] A61M 5/00; G01F 23/00
U.S. Cl. 604—260 5 Claims

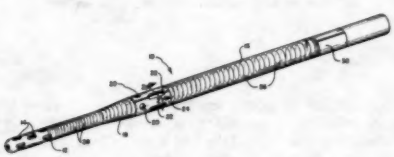


1. Apparatus for administering medical liquids comprising the combination of a calibrated flexible collapsible container and a liquid level indicating device which is supported on the outside surface of the calibrated container at about the upper level of the liquid contained therein wherein said collapsible container contains a liquid and is substantially devoid of air and said liquid level indicating device comprises a pair of spaced-apart, parallel elongated members which define a narrow rectangular slot, said slot being sized so that when a collapsed portion of the container is inserted therein opposing surfaces of said container are urged into abutting relationship with each other at about the level of the upper surface of liquid within the container.

4,639,252
VENOUS RETURN CATHETER

Michael N. Kelly, Salt Lake City, Utah; John B. Foster, Rolling Hills Estates, and Robert D. Foster, San Pedro, both of Calif., assignors to Research Medical, Inc., Salt Lake City, Utah

Filed Apr. 5, 1985, Ser. No. 720,172
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—282 16 Claims



1. A catheter for use in the venous drainage of blood during surgical procedures involving cardiopulmonary bypass, comprising:

a first diameter catheter portion forming the distal end of the catheter, said first diameter portion being suitable for placement within a vena cava, and said first diameter portion being provided with a plurality of drainage openings suitable for draining blood;

a second diameter catheter portion forming the proximal end of said catheter, said second diameter portion being in fluid communication with the first diameter portion, said second diameter catheter portion having a larger diameter than the first diameter portion, said second diameter portion being provided with drainage openings suitable for draining blood, and further being provided with reinforcement means for reinforcing a section of the second diameter catheter portion surrounding the drainage openings,

the reinforcement means comprising a substantially continuous layer of a reinforcing material, the drainage openings being punched through said layer of reinforcing material; and

a transistion catheter portion between the first and second diameter portions forming a smooth transition between said first and second diameter portions.

4,639,253

NONWOVEN SURGICAL SPONGE WITH X-RAY DETECTABLE ELEMENT

John Dyer, Randolph; John W. Kennette, Somerville; Alton H. Bassett, Princeton, and Stanley D. Hall, Plainsboro, all of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Continuation of Ser. No. 605,369, Apr. 30, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 802,067

Int. Cl.[4] A61F *13/00*

U.S. Cl. 604—362 **13 Claims**

1. A surgical sponge including an integral X-ray detectable element, said sponge comprising a fibrous, nonwoven fabric consisting essentially of entangled fibers arranged in an interconnecting patterned relationship in the plane of the fabric, and at least one visually colored X-ray detectable element positioned interiorly of said fibrous nonwoven fabric in the plane thereof, the fibers of said nonwoven fabric being intertwined about said X-ray detectable element to provide a fibrous covering of said X-ray detectable element on a first surface of said fabric which is lighter than the fibrous covering on the other surface of said fabric, whereby said X-ray detectable element is more readily visible on said first surface than on said other surface.

4,639,254

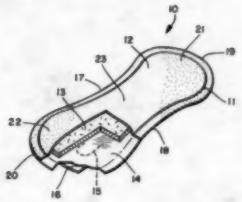
THREE-DIMENSIONAL SANITARY NAPKIN HAVING ABSORBENT MATERIAL CONTOURED ON THE BAFFLE SIDE

Robert H. LeGault, Neenah, Wis.; Arrigo D. Jezzi, Roswell, Ga.; James D. Milner, Appleton, Wis.; Barbara Oakley, and Paul G. Franke, both of Menasha, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 24, 1985, Ser. No. 790,702

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385 R **15 Claims**



1. A three-dimensional hourglass-shaped sanitary napkin comprising a fluid permeable cover with a body contacting surface, an absorbent material adjacent the fluid permeable cover and a fluid impermeable baffle adjacent the alternate side of the absorbent material and having a garment facing surface, said sanitary napkin being substantially hourglass-shaped, comprising (a) two end lobe regions and (b) a middle region, said absorbent material in said middle region being outwardly bulging in said middle region by a greater amount than the absorbent in the end region on the alternate absorbent side adjacent the baffle and wherein said middle region comprises a greater amount of absorbent than said lobe regions.

4,639,255

SOLID FORM ADDITIVES AND METHOD OF FORMING SAME

Alexander D. Schuettenberg, and James T. Gragson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 112,363, Jan. 15, 1980, abandoned. This application Oct. 16, 1980, Ser. No. 197,457

Int. Cl.[4] C10L *1/24*

U.S. Cl. 44—62 40 Claims

1. A solid form additive comprising:

a normally liquid fuel additive selected from carburetor detergent additives, antiknock additives, deposit-control additives, and mixtures thereof, suitable for use in fuel comprising gasoline for internal combustion engines; and

a structural agent for containing the fuel additive and for providing dimensional stability to the solid form additive, the structural agent being soluble and dispersible in the fuel;

wherein the fuel additive comprises between about 25% and about 75% by weight of the solid form additive; and wherein

the solid form additive is a pellet having structural agent and fuel additive essentially homogeneously dispersed throughout the solid form additive; and wherein

the pellet is coated with a sealing agent.

4,639,256

COLD FLOW IMPROVING ADDITIVE COMPOUND AND FUEL COMPOSITION CONTAINING SAME

Joan C. Axelrod, Media, Pa., and Sheldon Chibnik, Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 18, 1985, Ser. No. 810,114

Int. Cl.[4] C10L *1/22*

U.S. Cl. 44—71 43 Claims

1. A product of reaction useful for improving the low temperature characteristics of distillate hydrocarbyl fuels comprising an ester derivative of a branched chain monocarboxylic acid having at least one tertiary amine group and at least one ester group prepared by reacting substantially stoichiometric or equimolar amounts of said branched chain acid and an amine having at least one tertiary amine group for a time sufficient to obtain said ester derivative and wherein said branched chain acid is a telomer acid.

4,639,257

RECOVERY OF CARBON DIOXIDE FROM GAS MIXTURE

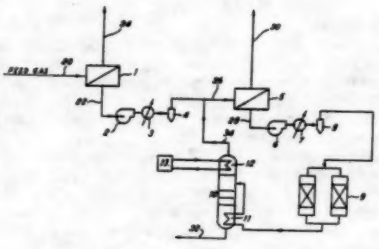
Melvyn Duckett, and David I. Limb, both of Stockport, United Kingdom, assignors to Costain Petrocarbon Limited, Wythenshawe, England

Continuation-in-part of Ser. No. 675,292, Nov. 17, 1984, abandoned. This application Jul. 15, 1985, Ser. No. 755,374

Claims priority, application United Kingdom, Dec. 16, 1983, 8508002; Mar. 27, 1985, 8333628

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 16 Claims



1. A process for the recovery of carbon dioxide from a gas mixture containing carbon dioxide in a concentration not greater than the equilibrium concentration at the freezing temperature of the mixture, the process comprising subjecting the gas mixture to membrane separation;

recovering from said membrane separation a permeate wherein the concentration of carbon dioxide is between said equilibrium concentration and 98% (by volume) of the permeate and thereafter

subjecting said permeate to distillation at sub-ambient temperature above the freezing temperature of the permeate; and

recovering substantially pure carbon dioxide as a liquid bottoms products of said distillation.

4,639,258

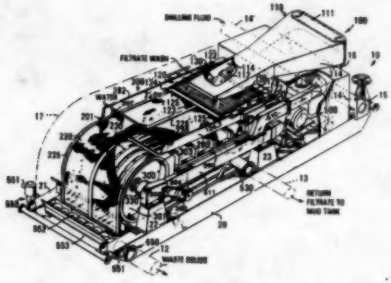
SINGLE PASS MUD REJUVENATION SYSTEM AND METHOD

Herman J. Schellstede, New Iberia, La., and James F. Youngblood, Houston, Tex., assignors to Leon E. Roy, New Iberia, La., a part interest

Filed Oct. 14, 1983, Ser. No. 541,923

Int. Cl.[4] B01G *19/00*; B01D *33/04*

U.S. Cl. 55—52 19 Claims



1. A method for rejuvenating drilling mud received from a well comprising the steps of:

(a) providing an endless filter having an upper surface and a lower surface,

(b) causing said endless filter to move along a predetermined path of travel,

(c) delivering a mixture of drilling mud including cuttings solids to the upper surface of said endless filter, and

(d) applying suction to the lower surface of said filter and drawing substantially all of the drilling mud through the filter and leaving said cuttings solids on the upper surface of said endless filter to provide rejuvenated mud beneath said filter.

4,639,259

PROMOTED SCAVENGER FOR PURIFYING HCL-CONTAMINATED GASES

Michael J. Pearson, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Oct. 9, 1985, Ser. No. 785,706

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—71 8 Claims

1. A process for purifying industrial gases containing HCl as a contaminant which comprises contacting the gas containing up to about 1% by volume HCl in the presence of water vapor in an amount ranging from about 25 ppmv to about 2% by volume with a thermally activated alumina-containing scavenger promoted with an alkaline earth metal, the promoted scavenger containing from about 0.5 to about 45% by weight alkaline earth metal and exhibiting in the activated state a minimal

surface area of about 50 m^2/g and a minimum pore volume of at least about 0.3 cm^3/g, maintaining the contact between the HCl contaminated gas the the promoted scavenger until the HCl content of the gas, after contact with the promoted scavenger, reaches a predetermined threshold HCl level discontinuing the contact and recovering the promoted scavenger containing the HCl impurity removed from the gas.

4,639,260

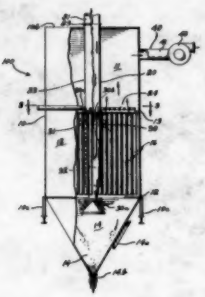
DUST SEPARATOR

Henry Borow, 185 Berlioz, Apt. 2N, Nuns Island, Verdun, Quebec, Canada (H3E 1C1)

Continuation-in-part of Ser. No. 627,196, Jul. 2, 1984, abandoned. This application Nov. 18, 1985, Ser. No. 798,956

Int. Cl.[4] B01D *46/04, 50/00*

U.S. Cl. 55—302 **16 Claims**



1. A gas filter apparatus for separating solids from a gas stream comprising a housing having a top, base, and side walls defining a chamber, a partition wall extending across the chamber and separating the chamber into an upper compartment and a lower compartment, a gas inlet conveyor tube in the chamber passing downwardly of the partition and into the lower compartment, the portion of the conveyor tube passing through said upper compartment being impervious and the portion of the conveyor tube extending downwardly into the lower compartment being provided with exit means including exit apertures at least in the area of the conveyor tube adjacent the partition wall, the partition wall being provided with a plurality of openings surrounding the conveyor tube and communicating the lower compartment with the upper compartment, filter means in the form of filter tubes covering each opening in the partition wall and extending downwardly in the lower compartment and parallel to the conveyor tube, at least one gas outlet communicating with the upper compartment, suction means associated with the gas outlet to provide a reduced pressure within the chamber, discharge means at the base of the housing associated with the lower compartment for discharging solid matter separated from the gas stream, whereby solid laden gas is conveyed into said lower compartment downwardly by the conveying tube and the gas of the stream is drawn from the conveyor tube immediately past the partition, through the surrounding filter tubes in order to prevent the formation of counter gas flows to the gravity discharge of the solids being separated from the gas stream.

4,639,261

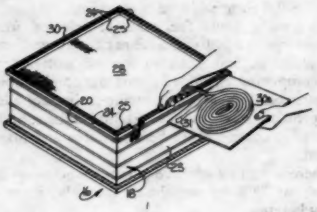
HIGH EFFICIENCY AIR FILTER

Clarence B. Pittman, Pinetown, and George H. Cadwell, Jr., Blounts Creek, both of N.C., assignors to Flanders Filters, Inc., Washington, N.C.

Filed Feb. 29, 1984, Ser. No. 584,819

Int. Cl.[4] B01D *46/52*

U.S. Cl. 55—502 **8 Claims**



7. An apparatus for filtering an airstream and comprising a supporting housing having an opening adapted to form a part of an air flow system having an airstream passing therethrough to define an air flow direction through said opening, a high efficiency air filter supported by said housing, and means for releasably sealing the periphery of said air filter to the periphery of said housing opening so as to permit the filter to be withdrawn from the housing and replaced with a fresh filter, the improvement wherein said sealing means comprises

a continuous peripheral channel surrounding said opening and sealably fixed to one of either said housing or said filter, said channel facing in a direction parallel to the air flow direction through said opening,

a sealant filling at least a substantial portion of said channel, said sealant comprising an essentially non-volatile and non-hardening gum-like uncured polysiloxane gum having a viscosity of at least about 500,000 centipoise and having a consistency substantially the same as modeling clay, and

a flange having a continuous cross sectional outline corresponding to that of said channel, said flange being sealably fixed to the other of either said housing or said filter and having a forward edge portion positioned within said channel and sealably embedded into said sealant.

4,639,262

METHOD AND APPARATUS FOR CARBON DIOXIDE LIQUEFACTION AND EVAPORATION

Albert N. Heichberger, 10960 Beach Blvd. 190 313, Jacksonville, Fla. 32216

Continuation of Ser. No. 622,217, Jan. 19, 1984, which is a continuation-in-part of Ser. No. 568,717, Jan. 6, 1984, Pat. No. 4,572,728, which is a continuation-in-part of Ser. No. 511,270, Jul. 6, 1983, Pat. No. 4,498,303. This application Jan. 13, 1986, Ser. No. 818,993

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—11 **18 Claims**

1. A method for selectively condensing carbon dioxide from a source gas flow, comprising merging source carbon dioxide after liquification and separation from noncondensed contaminating gases into evaporating liquid carbon dioxide coolant so as to preclude the need for intermediate conventional refrigeration apparatus, including:

providing a quantity of liquid carbon dioxide in a vertical configuration including, in ascending order, a lower removing region, a gas distributing region, a condensing region, and a gas collecting region;

introducing said flow of source gas into said gas distributing region;

removing heat from said liquid carbon dioxide within said condensing region at a rate sufficient to selectively con-

dense substantially all carbon dioxide from said flow of source gas therein;

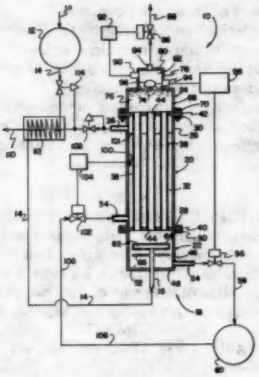
collecting noncondensed gas in said gas collecting region;

removing carbon dioxide liquid from said lower removing region; and

passing the removed carbon dioxide liquid as a coolant flow in indirect heat exchange relation with said condensing region while flashing at a rate sufficient to maintain said heat exchange relation.

12. Apparatus for selectively condensing carbon dioxide from a source gas flow, comprising means designed for merging source carbon dioxide after liquification and separation from noncondensed contaminating gases into evaporating liquid carbon dioxide coolant so as to preclude the need for intermediate conventional refrigeration apparatus, including:

a chamber configured to contain a quantity of liquid carbon dioxide in vertically arranged regions including, in ascending order, a lower removing region, a gas distributing region, a condensing region, and a gas collecting region;



inlet means for introducing said flow of source gas into said gas distributing region;

cooling means for removing heat from liquid carbon dioxide within said condensing region by indirect heat exchange;

said condensing region being configured such that substantially all carbon dioxide is selectively condensed from said flow of source gas while in direct heat exchange relation with liquid carbon dioxide therein;

collecting means for collecting noncondensed gas in said gas collecting region;

outlet means for removing carbon dioxide liquid from said lower removing region; and

cold path means for passing removed carbon dioxide liquid through said cooling means while flashing at a rate sufficient to maintain said heat exchange relation.

4,639,263

GLASSWARE FORMING PRODUCTION MONITOR

Joseph A. Kuliksuskas, Elmira, N.Y., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jul. 16, 1985, Ser. No. 755,522

Int. Cl.[4] C03B 9/44

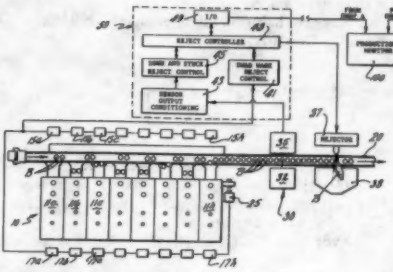
U.S. Cl. 65—158 **3 Claims**

1. In an apparatus for producing ware and including a plurality of forming sections; an outfeed conveyor for transporting ware from the forming sections for distribution and inspection; ware rejector means responsive to reject commands for removing unacceptable swab ware and down and stuck ware from the outfeed conveyor; a plurality of switches corresponding respectively to said forming sections for producing swab ware reject signals which designate swab ware to be rejected by said rejector means; and down and stuck detector located adjacent to said outfeed conveyor upstream of said ware rejector means and producing down and stuck reject signals in response to down and stuck ware; the improvement comprising:

reject controller means operatively connected between said switches and said rejector means and between said down and stuck detector and said rejector means for generating said reject commands in response to said swab ware signals and said down and stuck signals, said reject commands being timed with the arrival of the respective unacceptable ware adjacent to said rejector means,

communication controller means connected in operative relation with said reject controller means for transmitting a swab ware source signal when ware is rejected on account of swab ware contamination, and a down and stuck source signal when ware is rejected on account of a down and stuck condition,

first memory means connected in operative relation with said communication controller means, addressed by said swab ware source signals, and categorized by forming



section for tabulating the number of swab ware rejected per forming section during each of a plurality of first intervals,

second memory means connected in operative relation with said communication controller means, addressed by said down and stuck source signals and categorized by forming section for tabulating the number of down and stuck ware per forming section during each of said plurality of first intervals,

processor means connected in operative relation with said first memory means and said second memory means for tabulating the number of swab ware rejects per forming section over a selected interval encompassing a plurality of said first intervals and the number of down and stuck rejects per forming section over said selected interval, and

presentation means connected in operative relation with said processor means for visually presenting the number of swab ware rejects per forming section during said selected interval and the number of down and stuck ware rejects per forming section during said selected interval.

4,639,264

HERBICIDAL N-ARYLSULFONYL-N'-(4-MERCAPTOMETHYLPYRIMIDINYL)-UREAS

Werner Töpfl, Dornach, Switzerland, assignor to Ciga-Geigy Corporation, Ardsley, N.Y.

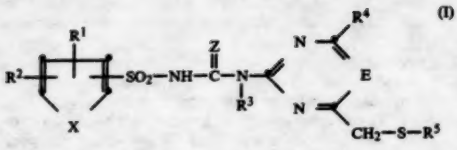
Filed Aug. 15, 1984, Ser. No. 641,091

Claims priority, application Switzerland, Aug. 26, 1983, 4669/83

Int. Cl.[4] A01N 57/16; C07F 9/65

U.S. Cl. 71—87 **19 Claims**

1. An N-arylsulfonyl-N'-(4-mercaptomethylpyrimidinyl)-urea of the formula I



(I)

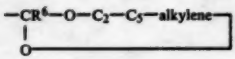
wherein

E is —CH=,

X is oxygen, sulfur, —NR^3—, —N=CR^3—, —CH=CH— or

Z is oxygen or sulfur,

R^1 is hydrogen, halogen, nitro, ethinyl, —$NR^{16}R^{17}$, —CR^6(—O—C_2—C_5—alkylene)—O—di-C_1–C_4-alkoxy,



—CW—R^6, —SO_2—NR^7R^8, —CO—R^9, —Y_m—R^{10}, —SO_2—R^{11} or O—SO_2R^{12}, in which m is zero or 1,

R^2 is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl or nitro,

R^3 is hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl or C_1–C_4-alkoxy,

R^4 is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_2–C_4-alkoxyalkyl, C_2–C_4-alkoxyalkoxy, cyclopropyl, —NH_2, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine

R^5 is

R^6 is hydrogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_3–C_6-cycloalkyl, C_4–C_7-cycloalkylalkyl or C_2–C_4-alkoxyalkyl,

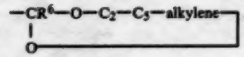
R^7 and R^{16} independently of one another are hydrogen, C_1–C_4-alkyl, C_1–C_4-cyanoalkyl or C_1–C_4-alkoxy,

R^8 and R^{17} independently of one another are hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl or C_1–C_4-alkoxy, or

R^7 and R^8 as well as R^{16} and R^{17} independently of one another form, together with the nitrogen atom binding them, a 5- to 7-membered saturated nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine,

R^9 is C_1–C_4-alkoxy, C_3–C_6-alkenyloxy, C_3–C_6-alkinyloxy, C_2–C_6-haloalkoxy, C_1–C_4-cyanoalkoxy, C_1–C_4-alkylthio, C_3–C_4-alkenylthio, C_3–C_4-alkinylthio, C_5–C_6-cycloalkoxy, C_4–C_7-cycloalkylalkoxy, —NR^7R^8 or C_2–C_6-alkoxyalkoxy,

R^{10} is C_3–C_4-alkinyl, C_2–C_4-alkenyl, C_1–C_4-alkyl, C_2–C_4-alkenyl mono- or polysubstituted by halogen, cyano, C_1–C_4-alkoxy or —SO_n—C_1–C_4-alkyl, or is C_1–C_4-alkyl mono- or polysubstituted by halogen, cyano, nitro, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-haloalkylthio, —SO_n—C_1–C_4-alkyl, —T—CX—R^{18},



—CO—R^6, —CO—R^9 or —SO_2—NR^7R^8, in which n is zero, 1 or 2,

R^{11} is C_2–C_4-haloalkoxy,

R^{12} is C_1–C_4-alkyl, C_1–C_4-haloalkyl or —$NR^{16}R^{17}$,

R^{14} and R^{15} independently of one another are C_1–C_4-alkyl, C_1–C_4-alkoxy, C_3–C_4-alkoxyalkoxy, C_3–C_4-alkenyloxy, C_1–C_6-alkylthio, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino,

R^{18} is C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or —$NR^{16}R^{17}$,

T is oxygen or sulfur,

W is oxygen or =N—O—R^3, and

Y is oxygen, sulfur, —SO— or —SO_2—;

and the salts of these compounds.

15. A herbicidal and plant-growth-inhibiting composition which contains, as active ingredient, at least one arylsulfonyl-N'-(4-mercaptomethylpyrimidinyl)-urea of claim **1**, together with carriers and/or other additives.

16. A method of controlling undesirable plant growth, which method comprises applying thereto or to the locus thereof an effective amount of an active substance of claim **1**.

4,639,265

THIOPHENE OR FURAN HERBICIDES

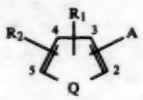
Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 574,711, Jan. 27, 1984, Pat. No. 4,547,217, which is a continuation-in-part of Ser. No. 247,134, Mar. 24, 1981, abandoned. This application Aug. 12, 1985, Ser. No. 764,617

Int. Cl.[4] **A01N** *47/36*; **C07D** *491/048, 491/052, 239/70*

U.S. Cl. 71—90 **15 Claims**

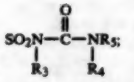
1. A compound of the formula:



wherein

Q is O or S;

A is



R_1 is $R_6S[O]_n$;

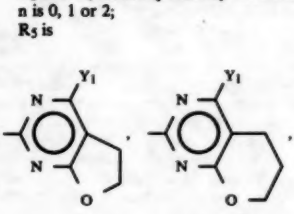
R_6 is C_1–C_4 alkyl, C_3–C_4 alkenyl, cyclopentyl or cyclopropylmethyl;

R_2 is H, Cl, Br or CH_3;

R_3 and R_4 are independently H or CH_3;

n is 0, 1 or 2;

R_5 is



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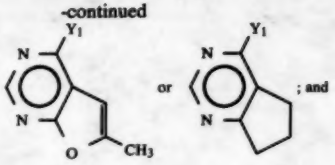


Y_1 is H, Cl, CH_3 or OCH_3;

and their agriculturally suitable salts; provided that both R_3 and R_4 may not simultaneously be CH_3, and further provided that R_1 and A are bonded to adjacent carbon atoms of the thiophene or furan ring.

4,639,266

PLANT PROTECTION AGENTS BASED ON 1,2,4-TRIAZOLE DERIVATIVES AND ALSO NEW DERIVATIVES OF 1,2,4-TRIAZOLE

Günther Heubach, Kelkheim; Klaus Bauer, Rodgau, and Hermann Bieringer, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

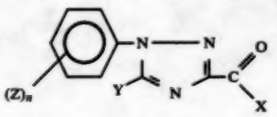
Filed Sep. 9, 1985, Ser. No. 774,067

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433249; Jul. 15, 1985, 3525205

Int. Cl.[4] A01N *43/653, 43/84;* **C07D** *294/08*

U.S. Cl. 71—92 **7 Claims**

1. A plant protection agent which contains an effective amount of a compound of the formula I



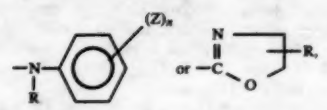
(I)

in which

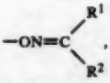
the Zs are identical or different and denote halogen, nitro, cyano, trifluoromethyl, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkoxy or $(C_1–C_4)$-alkylthio, it being possible for the alkyl, alkoxy and alkylthio groups to be substituted by one or more halogen atoms, in particular fluorine or chlorine, or $(C_3–C_6)$-cycloalkyl which can be substituted by $(C_1–C_4)$-alkyl, or denotes phenyl or phenoxy, it being possible for phenyl and phenoxy to be monosubstituted or polysubstituted by halogen and/or monosubstituted by trifluoromethyl,

Y denotes hydrogen, $(C_1–C_4)$-alkyl which can be wholly or partially substituted by halogen atoms and/or monosubstituted by $(C_1–C_4)$-alkoxy or $(C_1–C_4)$-alkylthio, or $(C_2–C_6)$-alkenyl or $C_2–C_6$)-alkinyl or denotes $((C_3–C_6)$-cycloalkyl which can be substituted by $(C_1–C_4)$-alkyl and/or a dichlorovinyl radical, and

X denotes hydroxyl, $(C_1–C_4)$-alkyl, $((C_3–C_6)$-cycloalkoxy, phenyl-$(C_1–C_6)$-alkoxy, phenoxy, $(C_2–C_6)$-alkenyloxy, $(C_2–C_6)$-alkinyloxy or $(C_1–C_6)$-alkoxy or $(C_1–C_6)$-alkylthio, it being possible for the alkoxy or alkylthio group to be substituted by $(C_1–C_2)$-alkoxy, mono-$(C_1–C_4)$-alkylaminocarbonyl, di-[$(C_1–C_4$ -alkyl]aminocarbonyl, phenylaminocarbonyl, N-[$(C_1–C_4$ -alkyl]-N--phenyl-aminocarbonyl, mono-$(C_1–C_6)$-alkylamino, di-$(C_1–C_6)$-alkylamino, $(C_1–C_6$ -alkylcarbonyloxy, $(C_1–C_2)$-alkylthio, cyano or halogen, or denotes a radical of the formulae



in which R in each case denotes hydrogen or $(C_1–C_4)$-alkyl, or denotes mono-$(C_1–C_4)$-alkylamino, di-$(C_1–C_4)$-alkylamino, $(C_5–C_6)$-cycloalkylamino, piperidino, morpholino or 2,6-dimethylmorpholino or a radical of the formula



in which R^1 and R^2 can be identical or different and denote $(C_1–C_4)$-alkyl radicals, and in which R^1 and R^2 together can also form a 5-membered, 6-membered or 7-membered cycloalkyl radical, and

n denotes the number 0, 1, 2 or 3, or, in the event that X=OH, salts thereof which can be employed for agriculture.

4,639,267

HERBICIDAL CYCLOHEXANE-1,3-DIONE DERIVATIVES

Graeme J. Farquharson, Carlton; Keith G. Watson, Blackburn North, and Graham J. Bird, Ascot Vale, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

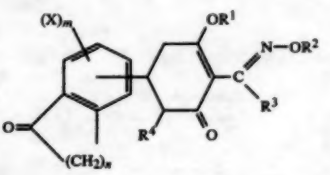
Filed Sep. 10, 1985, Ser. No. 774,526

Claims priority, application Australia, Sep. 24, 1984, PG7274

Int. Cl.[4] A01N *35/10;* **C07C** *131/00*

U.S. Cl. 71—98 **12 Claims**

1. A compound of the Formula I:



I

wherein:

m is zero or an integer selected from 1 to 3;

n is an integer selected from 2 to 4;

X, which may be the same or different, are indepdently selected from the group consisting of: halogen, C_1 to C_6 alkyl, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio;

R^1 is selected from the group consisting of: hydrogen; C_2 to C_6 alkanoyl; benzoyl and substituted benzoyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogens, nitro, C_1 to C_6 alkyl and C_1 to C_6 alkoxy; benzenesulfonyl and substituted benezenesulfonyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, C_1 to C_6 alkyl and C_1 to C_6 alkoxy; and an inorganic or an organic cation selected from the alkali metals, the alkaline earth metals, the transition metals, the ammonium ion and the tri- and tetra(alkyl) ammonium ions wherein alkyl is selected from C_1 to C_6 alkyl and C_1 to C_6 hydroxyalkyl;

R_2 is selected from the group consisting of: C_1 to C_6 alkyl; C_2 to C_6 alkenyl; C_2 to C_6 haloalkenyl; C_2 to C_6 alkynyl, C_3 to C_6 haloalkynyl; and substituted C_1 to C_6 alkyl wherein the alkyl group is substituted with a substituent

selected from the group consisting of halogen, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, phenyl and substituted phenyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, and C_1 to C_6 alkylthio;

R^3 is selected from the group consisting of: C_1 to C_6 alkyl; C_1 to C_6 fluoroalkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl; and phenyl; and

R_4 is selected from the group consisting of: hydrogen; halogen; cyano; C_1 to C_6 alkyl; and (C_1 to C_6 alkoxy) carbonyl.

10. A process for severely damaging or killing unwanted plants which process comprises applying to said plants, or to the growth medium of said plants, an effective amount of a compound as defined according to claim 1.

4,639,268

NITRO- AND CYANOGUANIDINES AS SELECTIVE PREEMERGENCE HERBICIDES AND PLANT DEFOLIANTS

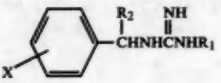
Robert L. Arotin, Yardley, Pa.; Bryant L. Walworth, Pennington, N.J., and Michele E. Marini, Blacksburg, Va., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 29, 1985, Ser. No. 759,703

Int. Cl.[4] A01N *37/34, 33/04*

U.S. Cl. 71—105 **10 Claims**

1. A method for the preemergence control of undesirable broadleaf weeds and grass plants comprising, applying to soil containing seeds or other propagating organs of said undesirable braodleaf weeds and grass plants a herbicidally effective amount of a substituted nitroguanidine or cyanoguanidine compound selected from the group consisting of



(I)

wherein R_1 is NO_2 or CN; R_2 is n-C_3H_7, CH_2OCH_3 or $CH_2CH{=}CH_2$; X is hydrogen, o-F, m-F, p-F, m-OCH_3, m-OH or p-Cl; the salts, tautomers and optical isomers thereof and the (+) or (−)-isomers of compounds having the above structure, wherein R_1 and X are as described and R_2 is CH_3, C_2H_5 or CF_3.

4,639,269

METHOD AND APPARATUS FOR THE REDUCING TREATMENT OF MOLTEN METALS AND/OR SLAGS THEREOF

Hermann Hilbrans, Langenfeld; Michael Gamroth, Cologne; Gerhard Melcher, Cologne, and Friedrich Megerle, Cologne, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Del.X

Filed Dec. 6, 1985, Ser. No. 805,805

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3444962

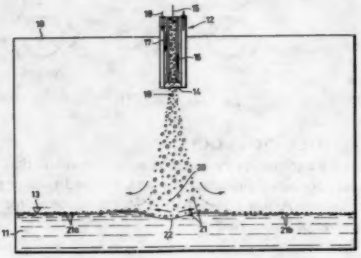
Int. Cl.[4] C22B *15/00*

U.S. Cl. 75—76 **12 Claims**

1. A method for reducing molten material comprising metals or slags which comprises:

providing a confined molten bath of said material,

blowing a high velocity reduction gas stream onto the surface of said molten bath to provide a blow impression therein, said reduction gas stream including coal or coke particles in an oxygen containing gas, the amount of oxygen containing gas being less than that required to convert said coal or coke completely to CO, thereby providing a reduction gas stream consisting partly of non-gasified coal or coke particles and partly of a CO containing gas, and



depositing said non-gasified coal or coke particles onto the surface of said melt outside the perimeter of said blow impression to inhibit reoxidation of said melt.

4,639,270

METHOD FOR PREPARING A COATING COMPOSITION FOR USE TO PRODUCE HEAT-SENSITIVE RECORD MATERIAL

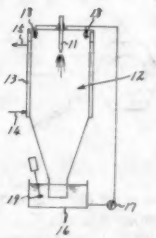
Masatoshi Ando, Nishinomiya; Hiromine Mochizuki, and Kazuta Saito, both of Amagasaki, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,774

Claims priority, application Japan, Jul. 30, 1982, 57-134038

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—21 **13 Claims**



1. In a method for preparing a coating composition for use to produce heat-sensitive record material comprising a base sheet having a color developing layer which includes finely divided particles comprising colorless chromogenic material and finely divided particles comprising acceptor which is reactive with said colorless chromogenic material to develop a color, at least one of said two kinds of finely divided particles further including a heat fusible material having a melting point within the range of 60° C. to 200° C., said heat fusible material being capable of dissolving at least one of said colorless chromogenic material and said acceptor therein when melted,

the improvement comprising the steps of:

admixing and heating at least one colorless chromogenic material or acceptor and at least one heat fusible material to form a co-melt,

atomizing said co-melt with a three-fluid type spray nozzle in which three different kinds of fluids comprising, respectively, said co-melt, an aqueous solution of a dispersing agent and high pressure steam or air, flow through three respective passages in said nozzle meeting at a common junction where said fluids are uniformly admixed and stirred before they are sprayed together from an opening in said nozzle to form finely divided particles comprising

said colorless chromogenic material or acceptor and said heat fusible material, and

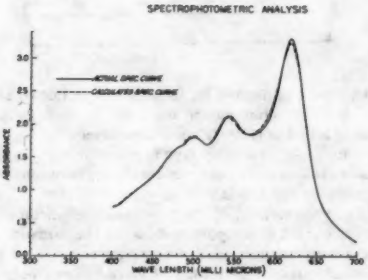
preparing a coating composition including said finely divided particles dispersed therein.

4,639,271

CHROMOGENIC MIXTURES

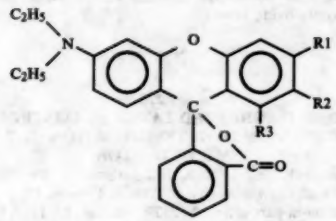
Robert W. Brunea, Grand Island, and James M. Raby, Lewiston, both of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,484
Int. Cl.[4] C09D 11/00
U.S. Cl. 106—21 **10 Claims**



1. A chromogenic mixture comprising:

(a) approximately 10% to 60% by weight of an orange chromogen having the following formula:



where R1, R2, and R3 are alkyl groups having 1–5 carbon atoms or hydrogen or combinations thereof;

(b) approximately 5% to 60% by weight of a blue, indigo or violet chromogen; and

(c) approximately 30% to 70% by weight of a green or single component black chromogen.

4,639,272

LIQUID COLORANT FOR ABS RESINS

Masashi Ito, Saitama; Toshio Ohashi, and Katsumi Ui, both of Aichi, all of Japan, assignors to Toyo Ink Mfg., Co., Ltd. and Toyoto Jidosha Kabushiki Kaisha, both of, Japan

Filed Jun. 26, 1985, Ser. No. 748,879
Claims priority, application Japan, Jun. 26, 1984, 59-130056
Int. Cl.[4] C08L 91/00, 67/02; C08K 5/10; C08J 3/20
U.S. Cl. 106—243 **13 Claims**

1. A liquid colorant for ABS resins, consisting essentially of 100 parts by weight of a pigment or dye and 25 to 2,000 parts by weight of a saturated liquid polyester prepared mainly from an aliphatic dicarboxylic acid and an alcohol component comprising a dihydric alcohol, and having a viscosity of 1,500 poises or less at room temperature.

4,639,273

ASPHALT-ADHESION IMPROVING ADDITIVES PREPARED BY FORMALDEHYDE CONDENSATION WITH POLYAMINES

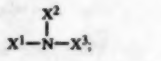
Dennis W. Gilmore, Fairfield, and Thomas G. Kugele, Cincinnati, both of Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

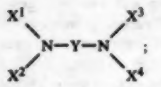
Continuation-in-part of Ser. No. 492,136, May 6, 1983, abandoned. This application Aug. 12, 1983, Ser. No. 522,751
Int. Cl.[4] C09D 3/24
U.S. Cl. 106—281 N **35 Claims**

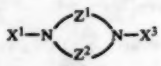
1. A composition of matter comprising

(a) an asphalt, and

(b) a formaldehyde adduct of an amine or amide, said formaldehyde adduct comprising a compound or mixture of compounds produced by the reaction of a formaldehyde source with an amine or amide having a formula selected from:

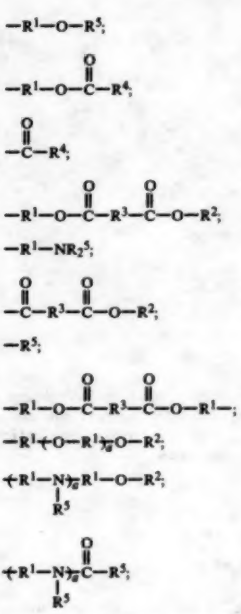

General Formula I


General Formula II


General Formula III

and adducts of said amines and amides with ethylene oxide; alkyl cycloalkyl, or aryl-substituted ethylene oxide; or cyclohexylene oxide; wherein:

i. X^1, X^2, X^3, and X^4 are independently selected from:



and hydrogen; or X_1 and X_2 or X_3 and X_4 together form a 5 or 6-membered ring containing at least one nitrogen

atom, optionally substituted by oxygen or R^5, provided that at least one X or one R^5 must be hydrogen;

ii. Y is selected from the group consisting of

$$-R\leftarrow N(X_b^1)-R_c^1\rightarrow_{\overline{d}};$$

$$-R^1-;$$

$$-R^1\leftarrow O-R^1\rightarrow_{\overline{d}};\text{ or}$$

$$-R^1-O-\overset{O}{\overset{\|}{C}}-R^3-\overset{O}{\overset{\|}{C}}-O-R^1-;$$

iii. Z^1 and Z^2 are independently selected from ethylene and substituted ethylene;

iv. R is selected from alkylene of from one to six carbon atoms and a 6-membered ring with two nitrogens;

v. R^1 is alkylene of from 1 to 20 carbon atoms, cycloalkylene, arylene, or the previous substituted by hydroxy, ester or hydrocarbyl-substituted alkylene;

vi. R^2 is alkyl of from 1 to 20 carbon atoms, cycloalkyl, aryl, alkaryl, aralkyl, hydrogen, or the previous substituted by hydroxy or ester;

vii. R^3 is alkylene, cycloalkylene, arylene, or the previous substituted by hydrocarbyl, hydroxyl, ester or

$$-CH=CH-;$$

viii. R^4 is alkenyl of from 1 to 20 carbon atoms, alkyl, aryl, alkaryl, aralkyl, or cycloalkyl, optionally substituted by hydroxy or ester;

$$-R^1\leftarrow O-R^1\rightarrow_{\overline{d}}OR_2;$$

$$\leftarrow R^1-N(R^5)\rightarrow_{\overline{d}}R^1-NR_2^5;$$

$$\leftarrow R^1-N(R^5)\rightarrow_{\overline{d}}R^1-O-R^2;\text{ or}$$

$$\leftarrow R^1-N(R^5)\rightarrow_{\overline{d}}\overset{O}{\overset{\|}{C}}-R^5;$$

ix. R^5 is hydrogen; alkenyl, alkyl, cycloalkyl, aryl, alkaryl, aralkyl, alkyl imidazoline, alkenyl imidazoline, or the previous substituted by hydroxy, ester, alkyl imidazoline or alkenyl imidazoline;

$$-R^1-OH;$$

or

$$-R^1-O-R^1-O-_eR^2;$$

x. a is 0 or 1; b is 0, 1, or 2; c is 0, 1, or 2; and

xi. compounds which contain at least two nitrogen atoms are not within the scope of General Formula I if they fall within the scope of General Formula II.

4,639,274

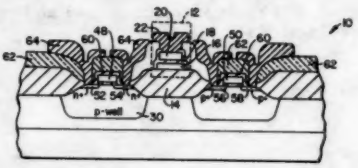
METHOD OF MAKING PRECISION HIGH-VALUE MOS CAPACITORS

Surinder Krishna, Fremont, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Nov. 28, 1984, Ser. No. 676,033

Int. Cl.[4] H01L *21/22, 21/265*

U.S. Cl. 148—1.5 **9 Claims**



1. An improved method for forming a capacitor on an integrated circuit structure comprising:

forming a first polycrystalline silicon layer;

implanting n-conductivity type ions into the first polycrystalline silicon layer at an implant energy between approximately 80 and 100 keV;

oxidizing the surface, of the polycrystalline silicon layer to form a uniform interpoly oxide layer, the oxidation being at a temperature which, for the implant dosage of the n-conductivity type ions, will make the interpoly oxide layer between approximately 770 and 2000 Angstroms thick;

annealing the interpoly oxide layer in a gaseous mixture including HCl at a temperature of approximately 1100° C.; and

forming a second polycrystalline silicon layer over said interpoly oxide layer.

4,639,275

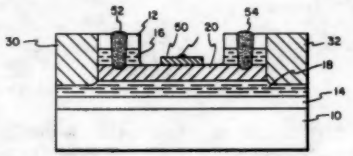
FORMING DISORDERED LAYER BY CONTROLLED DIFFUSION IN HETEROJUNCTION III-V SEMICONDUCTOR

Nick Holonyak, Jr., Urbana, Ill., assignor to The Board of Trustees of The University of Illinois, Urbana, Ill.

Continuation-in-part of Ser. No. 370,756, Apr. 22, 1982, Pat. No. 4,511,408. This application Aug. 31, 1984, Ser. No. 646,739

Int. Cl.[4] H01L *21/263, 21/265*

U.S. Cl. 148—1.5 **23 Claims**

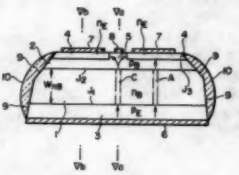


1. A method for converting a multilayer semiconductor structure, which comprises first active semiconductor regions interposed between second semiconductor barrier layers, into a disordered alloy of both said first and second semiconductors, said alloy exhibiting a higher energy gap than said first active semiconductor region, the method comprising diffusing a disordering element, selected from the group consisting of silicon, germanium, and tin, into said multilayer structure said diffusing being performed at a temperature in the range between about 700° C. and 850° C.

4,639,276
METHOD OF MAKING THYRISTOR WITH A HIGH TOLERABLE BIAS VOLTAGE

Tsutomu Nakagawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 536,797, Sep. 28, 1983, abandoned. This application Sep. 19, 1985, Ser. No. 777,577
Claims priority, application Japan, Sep. 28, 1982, 57-171415
Int. Cl.[4] H01L *21/265*
U.S. Cl. 148—1.5 7 Claims

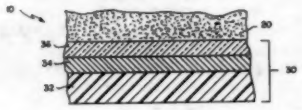


1. A process for fabricating a thyristor, comprising:
preparing a semiconductor substrate of a first conductivity type by exposing said substrate to neutron irradiation in a pattern such that a central area of said substrate is exposed to a higher dose of neutron radiation than is the peripheral area, in order to form a higher impurity concentration at said central area;
diffusing an impurity of a second conductivity type into the upper and lower surfaces of said substrate to form a base layer (2) of said second conductivity type on the upper surface thereof, and a first emitter layer (3) of said second conductivity type on the lower surface thereof;
diffusing an impurity of said first conductivity type from the upper surface of said substrate to form a second emitter layer (4) on portions of said upper surface except for a central gate region (5) thereof, said gate region being formed over said central area.

4,639,277
SEMICONDUCTOR MATERIAL ON A SUBSTRATE, SAID SUBSTRATE COMPRISING, IN ORDER, A LAYER OF ORGANIC POLYMER, A LAYER OF METAL OR METAL ALLOY AND A LAYER OF DIELECTRIC MATERIAL

Gilbert A. Hawkins, Mendon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 2, 1984, Ser. No. 626,848
Int. Cl.[4] H01L *27/12, 29/04*
U.S. Cl. 148—33.3 4 Claims

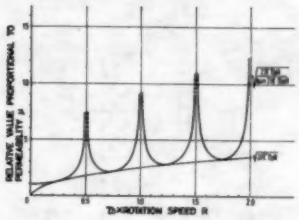


1. A substrate having thereon a layer of semiconductor material containing one or more majority carrier semiconductor devices, said substrate comprising, in order,
a layer of organic polymer;
a layer of metal or metal alloy;
and a layer of dielectric material completely isolating said metal or metal alloy later from said semiconductor material;
said dielectric layer and said metal or metal alloy layer together having thickness that are sufficient to disipate the heat that occurs when said semiconductor material is heated to 1000° C., without causing significant decomposition or thermal expansion of said polymer layer.

4,639,278
METHOD OF MANUFACTURING AN AMORPHOUS MAGNETIC ALLOY

Yoshimi Makino; Yoshitaka Ochiai; Satoru Uedaira; Kazuhide Hotai; Koichi Aso, all of Yokohama, and Masatoshi Hayakawa, Chigasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 314,737, Oct. 23, 1981, abandoned. This application Dec. 23, 1983, Ser. No. 564,729
Claims priority, application Japan, Oct. 31, 1980, 55-153985
Int. Cl.[4] C21D *1/04*
U.S. Cl. 148—108 7 Claims



1. A method of manufacturing an amorphous magnetic alloy comprising the steps of:
(A) preparing an amorphous magnetic alloy ribbon, and
(B) annealing said ribbon at an elevated temperature less than the crystallization temperature of said alloy, said annealing being carried out in a magnetic field, said ribbon and said magnetic field being continuously rotated with respect to each other, the relative rotation being at a velocity substantially meeting the following relationship:

$$R_{\tau 0}=0.5n$$

where:
R is the number of revolutions per minute,
τ_0 is the average time required to cause the amorphous alloy material to reach a thermal equilibrium state of induced magnetic anisotropy, and
n is an integer of at least 1.

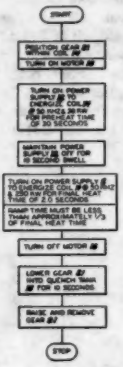
4,639,279
SINGLE FREQUENCY INDUCTION HARDENING PROCESS

Madhu S. Chatterjee, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1985, Ser. No. 797,707
Int. Cl.[4] C21D *9/24*
U.S. Cl. 148—147 2 Claims

1. In a single shot process for contour hardening a gear by induction, the process including a preheat step during which the gear is positioned within an encircling coil and heated by supplying the coil with alternating current for a desired preheat interval at a preheat power level, and a final heat step during which the gear is maintained within the coil and further heated by supplying the coil with alternating current for a desired final heat interval at a final heat power level, the improvement wherein:
the alternating current supplied to the coil in both the preheat and final heat steps is of a single frequency in the

general range of 50 kHz–100 kHz, and the time required for the supplied power level to achieve the final heat



power level in the final heat step is no more than approximately one-third of the desired final heat time.

4,639,280

MONOCRYSTALLINE ALLOY WITH A NICKEL MATRIX BASIS

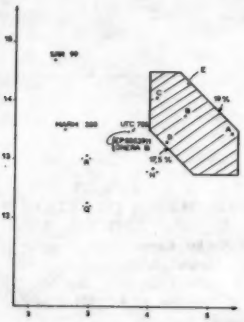
Allan Fredholm, Evry; James H. Davidson, Varennes-Vauzelles; Tasadduq Khan, Jouy-en-Josas, and Jean-Marc C. F. Theret, Versailles, all of France, assignors to Association pour la Recherche et le Developpement des Methodes et Processus Industriels "A.R.M.I.N.E.S." , Paris; Societe Imphy S.A., Paris La Defense; Office National d'Etudes et de Recherche Aerospatiales (ONERA), Chatillon and Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.", Paris, all of, France

Filed Dec. 10, 1984, Ser. No. 679,766

Claims priority, application France, Dec. 29, 1983, 83 20986

Int. Cl.[4] C22C *19/05*

U.S. Cl. 148—404 **14 Claims**



1. Monocrystalline alloy with a nickel base matrix having a high creep resistance, having a density of the order of 8.6% and consisting essentially of the following composition:

Co	5	to	8%
Cr	6.5	to	10%
Mo	0.5	to	2.5%
W	5	to	9%
Ta	6	to	9%
Al	4.5	to	5.8%

-continued

Ti	1	to	2%
Nb	0	to	1.5%
C,Zr,B	each less than 100 ppm		
Ni	remainder to 100%		

the percentages being given by weight, and the following criteria being observed:

the summation of the percentages by weight of Ta+Mo+½W lies between 11.5% and 13.5%;

the summation of Ti+Al+Ta+Nb in atomic percentages lies between 15.5 and 17%;

the summation of the atomic percentages of Ta+Nb+Mo+½W lies between 4 and 5.5%;

the summation of the atomic percentages Ti+Al+Ta+Nb+Mo+½W lies between 17.5 and 19%; and the summation of the atomic percentages Ti+Al lies between 12.8% and 14.5%.

4,639,281

ADVANCED TITANIUM COMPOSITE

Shankar M. Sastry, Chesterfield; James E. O'Neal, Bridgeton, and Tzy C. Peng, St. Louis, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 350,276, Feb. 19, 1982. This application Dec. 2, 1983, Ser. No. 557,597

Int. Cl.[4] C22C *14/00*

U.S. Cl. 148—407 **11 Claims**

1. In an annealed titanium alloy, the improvement consisting essentially of the inclusion of anneal developed in situ formed fibrous dispersoids in a rapidly solidified titanium matrix, the dispersoids being effective to produce an increased strength in the resulting alloy.

4,639,282

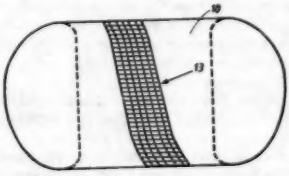
INSULATION OF METALLIC SURFACES IN POWER TRANSFORMERS

Bertil Moritz, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Feb. 18, 1986, Ser. No. 829,953

Int. Cl.[4] H01B *13/26*

U.S. Cl. 156—53 **14 Claims**



1. A method for electrically insulating a metallic surface immersed in an electrically insulating liquid medium which is

subjected to a high d.c. voltage, which method comprises covering the metallic surface with an electrically insulating layer comprising at least three layers of a wrapping material having a fibrous and porous structure, the individual layers having through-going pores or openings with an opening area in the range 0.2–10 mm^2 and with an aggregate pore area which is from 20 to 80% of the total area of the wrapping material.

4,639,283

METHOD FOR MAKING A DIAPHRAGM FOR AN ELECTRO-ACOUSTIC TRANSDUCER

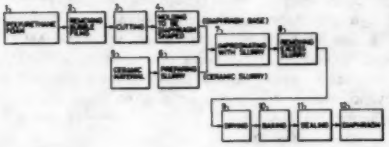
Akira Nakamura, Iwata, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 29, 1984, Ser. No. 676,280

Claims priority, application Japan, Dec. 2, 1983, 58-227890; Dec. 2, 1983, 58-186695

Int. Cl.[4] B32B *19/06;* **C04B** *38/06;* **B28B** *1/26, 7/34*

U.S. Cl. 156—89 **8 Claims**



1. A method for making a diaphragm for an electro-acoustic transducer, comprising:

(a) providing a plate-shaped mold of combustible foamed plastics material having as a mold cavity a network of open interstices extending three-dimensionally therethrough and being exposed externally thereof;

(b) filling said mold cavity with a slurry of ceramic material;

(c) baking said ceramic material and burning-away said foamed plastics material, thereby providing a diaphragm base made of baked ceramic material having a network of open interstices extending three-dimensionally therethrough and being exposed externally thereof; and

(d) applying a sealant to said diaphragm base so as to render said diaphragm base substantially air-impermeable thicknesswise thereof.

2. The method of claim 1, wherein:

said diaphragm base has a front surface and a back surface and the step of applying a sealant is carried out by adhering to at least one of said surfaces a sheet made of any one of Al, Be, Ti, B, carbon fiber-reinforced plastic material and aramid fiber-reinforced plastic material.

4,639,284

PROCESS FOR MANUFACTURING A VARIABLE PITCH MULTI-BLADE PROPELLER BY MOLDING RESIN-IMPREGNATED FAILS AROUND A PREFORM

René L. Mouille, Aix-en-Provence; Marc Declerco, Pelissane; Jean-Pierre Jalaguier, Vitrolles, and Bernard Jaugey, Marseilles, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Division of Ser. No. 587,649, Mar. 8, 1984. This application Jan. 4, 1985, Ser. No. 688,896

Claims priority, application France, Mar. 18, 1983, 83 04448

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—213 **4 Claims**

1. A process for manufacturing a rotor blade having

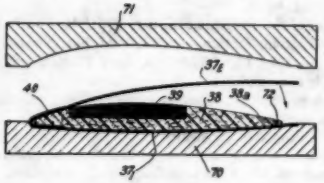
a shell with aerodynamic profile having an upper face and a lower face both extending from a blade leading edge part to a blade trailing edge part and each formed of a stacking of at least two foils of high mechanical resistance fiber fabrics rigidified by a polymerized synthetic impregnation resin,

a filling body in a foam-like synthetic material which has the same general profile as said shell and is disposed in the latter, extends chordwise from said leading edge part to said trailing edge part and presents a cut-out extending spanwise over all the length of said filling body and opening in a face of said filling body which is turned towards said upper face of said shell,

a spar constituted by a single elongated leaf of rovings of fibers with high mechanical resistance agglomerated by a polymerized synthetic resin, said spar having a longitudinal axis substantially parallel to that of the blade and presenting a spanwise extending major part provided with a section corresponding substantially to that of said cut-out, said spar major part being housed and fixed in said cut-out and presenting a spar face turned towards said shell upper face and along which said spar major part is directly fixed against an inner surface part of said shell upper face, said spar further presenting an end part emerging from said shell and arranged as a twistable and flexible spar root part for connecting said spar to a rotor hub, and

a metal leading edge cover integrated in said shell in said leading edge part;

the process being carried out by means of a lower half mould and a upper half mould provided with complementary impressions having the forms respectively of said lower face and of said upper face and the process comprising the following steps of



depositing and stacking in said lower half mould impression said at least two foils of fiber fabrics for forming said shell lower face and which are impregnated with a polymerizable synthetic resin,

positioning said filling body, made as a preformed body in a separate equipment, above said stacked foils,

disposing a major part of said leaf of rovings of fibers which are agglomerated by a polymerizable synthetic resin in said cut-out of said filling body and arranging an end part of said leaf of rovings beyond spanwise end of said cut-out for forming said spar root part,

depositing and stacking said at least two foils of fiber fabrics for forming said shell upper face and which are impregnated with a polymerizable synthetic resin on said stacked foils for forming said shell lower face, said filling body and said leaf of rovings thus assembled in said lower half mould,

installing said metal leading edge cover over parts of said stacked foils for forming said shell lower and upper faces which are adjacent to said leading edge part in said lower half mould,

placing said upper half mould on said lower half mould so that said stacked foils for forming said shell upper face are positioned in said upper half mould impression, and closing said half moulds against one another, and

polymerizing said resins impregnating said foils of fiber fabrics and agglomerating said rovings of fibers of said leaf.

4,639,285

HEAT-RESISTANT FLEXIBLE LAMINATE FOR SUBSTRATE OF PRINTED CIRCUIT BOARD AND A METHOD FOR THE PREPARATION THEREOF

Nlichiro Suzuki, Tokyo; Yoshimi Ogushi, Saitama; Kiyoshi Imai, Gunma; Nobuhiro Ohta, Kanagawa, and Susumu Ueno, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,004

Claims priority, application Japan, Feb. 13, 1985, 60-26057

Int. Cl.[4] B32B *31/00*; B29C *17/08*

U.S. Cl. 156—272.6 6 Claims

1. A method for the preparation of a metal-foiled flexible laminate formed of a flexible base film of an electrically insulating synthetic resin and a metal foil adhesively bonded to the base film and suitable for use as a substrate of printed circuit board which comprises the steps of:

(a) subjecting at least one surface of a base film of a synthetic resin to exposure to low temperature plasma generated in an atmosphere of an organcsilicon compound in a gaseous form under a pressure in the range from 0.001 to 10 Torr; and

(b) adhesively bonding a metal foil to the surface of the base film exposed to the low temperature plasma by use of a silicone-based adhesive intervening therebetween.

4,639,286

CURABLE COMPOSITIONS CONTAINING AZLACTONE-FUNCTIONAL COMPOUNDS

Jerald K. Rasmussen, Stillwater; Steven M. Heilmann, North St. Paul, and Frederick J. Palensky, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 424,500, Sep. 27, 1984, Pat. No. 4,485,236. This application Aug. 17, 1984, Ser. No. 641,924

Int. Cl.[4] C09J *3/14, 5/04*; C08G *69/42*

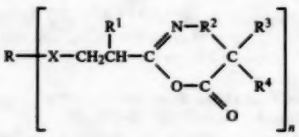
U.S. Cl. 156—307.3 14 Claims

11. A process for adhering two substrates together comprising the steps:

(1) providing two substrates,

(2) coating, without solvent, upon one surface of one substrate a layer of the azlactone-functional compound having the formula

Formula I



wherein

R^1 is hydrogen, chlorine or a methyl group;

R^2 is a single bond of a methylene or ethylene group, the last two of which can be substituted by alkyl groups having 1 to 6 carbon atoms or phenyl groups;

R^3 and R^4 are independently an alkyl or cycloalkyl group having up to 12 carbon atoms, an aryl or aralkyl group having 6 to 12 carbon atoms, or R^3 and R^4 taken together with the carbon atom to which they are attached form a 5- to 12-membered carbocyclic ring;

X is a nucleophilic group selected from

and —S—, in which R^5 is a hydrocarbyl group selected from (1) an alkyl or cycloalkyl group having up to 18 carbon atoms and (2) an aryl or aralkyl group having 6 to 12 carbon atoms;

R is a mono or polyvalent organic group that has a valence of n and is the residue of a nucleophilic group-substituted compound, $(HX)_nR$, in which X is defined above, the residue having a molecular weight up to 20,000, R being selected from (1) an aliphatic group having 2 to 20 carbon atoms, these groups optionally having one to four catenary heteroatoms of oxygen, nitrogen or sulfur, (2) polyoxyalkylene, (3) polyester, (4) polyolefin, (5) polyacrylate, and (6) polysiloxane, all optionally including at least one non-nucleophilic or nucleophilic group, and

n is an integer having a value of one to six, and

(3) coating, without solvent, upon one surface of said second substrate a layer of at least one nucleophilic group-substituted compound, $R^6(YH)_m$, wherein

R^6 is an organic group that has a valence of m and is the residue of a nucleophilic group-substituted compound, $R^6(YH)_m$, R^6 being selected from

(a) mono- and polyvalent aliphatic and aromatic groups having 2 to 20 carbon atoms and optionally one to four caternary heteroatoms selected from oxygen, nitrogen, and sulfur,

(b) mono- and polyvalent groups selected from polyoxyalkylene, polyester, polyolefin, polyacrylate, and polysiloxane having a molecular weight up to 500,000,

both (a) and (b) groups being optionally substituted by at least one non-nucleophilic group or atom selected from cyano, halo, ester, ether, keto, nitro, silyl, and sulfide, wherein

Y is —O—, —X—, or

in which R^7 is hydrogen or a lower alkyl group of one to four carbon atoms, and

m is an integer having a value of 1 to 20,000,

(4) pressing the coated surfaces of the substrates together, and

(5) allowing said at least one nucleophilic compound to cure said azlatone-functional compound.

4,639,287

LABEL FEED CONTROL SYSTEM

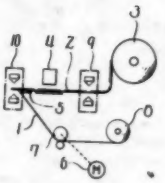
Yasuhiro Sakura, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,833

Claims priority, application Japan, May 26, 1980, 55-69825; May 26, 1980, 55-69826; Jun. 20, 1980, 55-83572; Jun. 20, 1980, 55-83573

Int. Cl.[4] B65H *5/28*

U.S. Cl. 156—361 11 Claims



1. A label feed control system comprising a driver means for driving a feed means which transports a paper base ribbon with labels lightly adhered thereon, a separator means for peeling said label off said base ribbon, a label detector disposed adjacent said separator means for detecting a peeled-off front edge of said label while said label adheres to said base ribbon and after the front edge is peeled off said base ribbon by said separator means, and an incremental feed means for controlling the operation of said driver means such that said base ribbon is fed

for a certain amount after said label detector has detected the peeled-off front edge of said label.

4,639,288

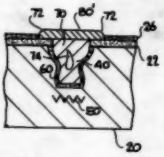
PROCESS FOR FORMATION OF TRENCH IN INTEGRATED CIRCUIT STRUCTURE USING ISOTROPIC AND ANISOTROPIC ETCHING

William L. Price, Saratoga; Ronald L. Schlupp, Los Gatos, and Mammen Thomas, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 5, 1984, Ser. No. 668,225

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **19 Claims**



1. An improved method for making a trench in an integrated circuit structure wherein voids formed during deposition of material to refill the trench are not opened during planarization whereby oxidation of the walls of the void is prevented, the method comprising:

(a) patterning a silicon oxide layer previously deposited on a silicon integrated circuit structure containing device regions to be separated by said trench to form a mask;

(b) isotropically etching through said mask a shallow opening in said silicon layer sufficiently to undercut the edges of the openings in said overlying silicon oxide mask;

(c) anisotropically etching said silicon through said same mask to the desired depth of the trench;

(d) oxidizing the walls of said trench to provide electrical insulation between devices in said integrated circuit structure separated by said trench;

(e) refilling the trench by depositing material therein;

(f) planarizing said structure to remove any of said material deposited on the surface of said structure adjacent said trench; and

(g) growing an oxide layer layer said material in said trench.

4,639,289

PROCESS FOR PRODUCING A MAGNETIC READ - WRITE HEAD AND HEAD OBTAINED BY THIS PROCESS

Jean-Pierre Lazzari, Corenc, France, assignor to Commissariat a l'Energie Atomique, Paris, France

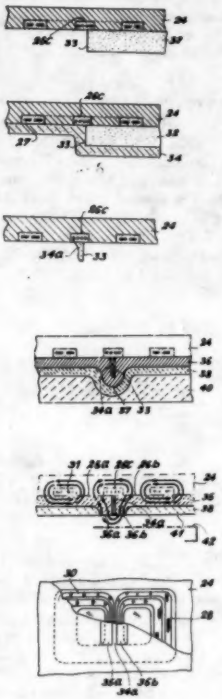
Filed Jan. 30, 1985, Ser. No. 696,517

Claims priority, application France, Feb. 3, 1984, 84 01879

Int. Cl.[4] G11B *5/127, 5/17, 5/187;* **B44C** *1/22*

U.S. Cl. 156—643 **4 Claims**

1. A process for producing a magnetic read-write head, comprising the steps of: depositing a first magnetic material film on a support, etching a groove in said first magnetic film, said groove being shaped like a figure eight with two loops having in common a rectilinear central portion, the magnetic film being preserved within said two loops and forms there two central pole pieces separated by a central channel corresponding to the central portion of the figure eight, filling the groove with an electrically insulating material, etching in the insulating material a notch forming a double groove wound respectively around the two central pole pieces, depositing a conductive coating at the bottom of the double groove and then filling the double groove with a first electrically insulating material, depositing a second insulating material layer on the two central pole pieces and on the first electrically insulating material, etching in said layer a step having a side substantially perpendicular to the surface of the central portion of the figure eight but which is slightly off-center with respect thereto, depositing an amagnetic material film on the thus etched step, anisotropic etching said amagnetic film so as to only leave a wall of said amagnetic film perpendicular to the plane of the films and constituted by that part of the amagnetic film deposit-



ing on the side of the step, depositing a second magnetic material film forming a boss covering the wall, depositing a protective coating on said second magnetic material film and covering the boss and cutting the protective coating of the second magnetic material film and the amagnetic wall, along a common horizontal plane substantially parallel to said first magnetic film, pole pieces are separated by an air gap.

4,639,290

METHODS FOR SELECTIVELY REMOVING ADHESIVES FROM POLYIMIDE SUBSTRATES

Richard N. Leyden, Topanga, and Robert Lawrence, Malibu, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 9, 1985, Ser. No. 806,874

Int. Cl.[4] B44C *1/22;* **B29C** *17/08;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—644 **14 Claims**

1. A method for forming holes of predetermined size in a polyimide substrate having thereon a metallic layer and an adhesive layer linking said polyimide substrate to said metallic layer, said adhesive including a cross-linked acrylic polymer, comprising:

(a) forming at least one opening in said metallic layer, exposing a portion of said adhesive layer;

(b) contacting the portion of said adhesive layer exposed in said at least one opening with an alkaline glycol solution at a temperature in the range of about 120° C. to about 145° C., and for a time sufficient to loosen said exposed portion

of said adhesive layer, and then removing said exposed portion of said adhesive layer by contacting said exposed portion with an adhesive-removing medium; and

(c) contacting the portion of said polyimide substrate exposed by the removal of said portion of said adhesive layer, with an etchant for selectively removing exposed polyimide substrate from said at least one opening, said etchant being substantially non-reactive with said adhesive layer under the conditions of said contacting.

4,639,291

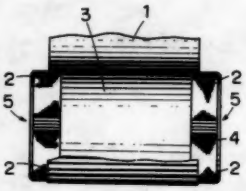
METHOD OF CONTROLLING MOISTURE PROFILE IN PAPER WEB IN PAPER DRYING PROCESS AND APPARATUS PRACTICING SAME

Toyokazu Ota, Omihachiman; Yutaka Nakamura, Tomakomai; Yutaka Ikeda, Tomakomai; Shunzi Katsoka, Tomakomai, and Yoshinobu Ito, Tomakomai, all of Japan, assignors to Shikishima Canvas Kabushiki Kaisha, Osaka and Oji Seishi Kabushiki Kaisha, Tokyo, both of, Japan

Filed Oct. 19, 1984, Ser. No. 662,483

Int. Cl.[4] D21F *5/02*

U.S. Cl. 162—207 **9 Claims**



1. A method for adjusting the moisture profile across the width of a wet paper web being fed longitudinally and wrapped partially around the dryer cylinder in the drying section of a papermaking machine characterized by contacting the wet paper web with the surface of a dryer cylinder, said surface having in a circumferential area around said cylinder where the moisture profile of said wet paper web is adjusted, a synthetic fabric having filaments extending longitudinally and filaments extending transversely of said cylinder in the direction of cylinder rotation, said longitudinally extending filaments and said transversely extending filaments, with said dryer cylinder surface, forming air filled heat insulting voids between the interstices between said filaments and said wet paper web width contacting said synthetic fabric and feeding said wet paper web around said cylinder to dry said paper web and adjust the moisture profile thereacross.

4,639,292

DRYING CYLINDER FOR USE IN PAPER MAKING

Toyokazu Ota, Omihachiman, and Yutaka Nakamura, Tomakomai, both of Japan, assignors to Oji Seisha Kabushiki Kaisha, Tokyo and Shikishima Canvas Kabushiki Kaisha, Osaka, both of, Japan

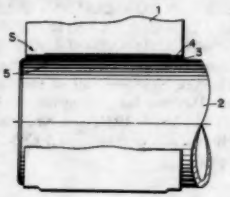
Filed Oct. 19, 1984, Ser. No. 662,481

Claims priority, application Japan, Dec. 6, 1983, 58-189012

Int. Cl.[4] D21F *5/02*

U.S. Cl. 162—375 **5 Claims**

1. A drying cylinder for use in controlling the moisture profile of paper web in the cross machine direction in the drier section of a paper making machine comprising, a built-up insulating sheet fixedly wound around the circumferential surface of said drying cylinder in the surface portion where the width of said paper web where the mositure profile is controlled contacts said drying cylinder said insulation sheet being built up of a fluoride resin coated sheet having an adhesive agent coated layer on the one side thereof and a synthetic fabric sheet having air holding voids defined between interstices of the filaments forming the fabric sheet and adhered to said fluorine resin coated sheet, said fabric sheet having a width slightly smaller than that of said fluorine resin coated sheet, said built-up insulating sheet being adhered to the circumferential surface of said drying cylinder with said fabric



sheet having said air holding voids against said cylinder surface through said adhesive agent coated layer exposed at the end portion of said fluorine resin coated sheet and extending beyond the opposite longitudinal edges of said smaller width fabric sheet.

4,639,293

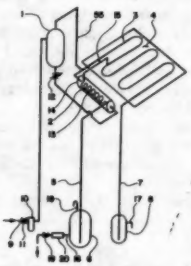
PARTIALLY EVACUATED SOLAR STILL

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed May 6, 1983, Ser. No. 492,445

Int. Cl.[4] B01D *3/10*

U.S. Cl. 202—205 **5 Claims**



1. A partially evacuated solar still comprising in combination:

(a) a solar collector including a plurality of heater tubings wherein solar heat collected by the solar collector heats said heater tubings;

(b) a feed water supply means including a feed tubing for feeding water into said heater tubings wherein said water is evaporated to steam by heat transferred to said heater tubings from said solar collector;

(c) means for withdrawing said steam from said heater tubings through at least one steam tubing branching off from said heater tubings;

(d) a condenser for condensing said steam into water wherein the heat of condensation released by the steam is used to preheat the water fed to said heater tubings;

(e) a flow controlling means on said feed tubing for controlling the feed rate of the water fed to said heater tubings;

(f) means connected to said heater tubings for creating and maintaining a partial vacuum in said heater tubings; and

(g) means for purging reject water from said heater tubings without breaking said partial vacuum in said heater tubings.

4,639,294

PROCESS FOR PRODUCTION SORBIC ACID

Noboru Kamei; Kinjiro Ikeda; Keishi Aoyama, and Seitaro Hamano, all of Niigata, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 16, 1985, Ser. No. 755,518
Claims priority, application Japan, Jul. 16, 1984, 59-146027
Int. Cl.[4] B01D 3/12
U.S. Cl. 203—88 6 Claims

1. A process for producing sorbic acid by first reacting crotonaldehyde with ketene to prepare a polyester, then decomposing the polyester with hydrochloric acid, separating the crude sorbic acid from the reaction solution, and purifying the separated sorbic acid, said purifying step comprising the following steps:

(a) continuously dissolving the crude sorbic acid in petroleum at a temperature in the range of from 100° to 140° C. while evaporating the residual water and hydrochloric acid from the solution of the sorbic acid in petroleum;

(b) separating the tar content from the petroleum solution at a temperature in the range of from 100° to 140° C.;

(c) thereafter substantially precluding the formation of solid state (rigid) tar by subjecting the mixture of sorbic acid and petroleum to flash evaporation in a film-type evaporator at a reduced pressure in the range of from 20 to 60 mmHg.; and

(d) recycling residue from the bottom of the evaporator to step (b).

4,639,295

ZINC PHOSPHATING METHOD

Satoshi Miyamoto, Kanagawa, and Masamichi Nagatani, Tokyo, both of Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Filed Aug. 14, 1985, Ser. No. 765,624
Claims priority, application Japan, Aug. 14, 1984, 59-170298
Int. Cl.[4] C25D 11/36
U.S. Cl. 204—38.1 14 Claims

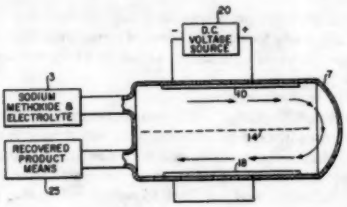
1. In a method for applying a zinc phosphate coating to a metal substrate, wherein said substrate is first given a conventional zinc phosphate coating, the improvement comprising providing a further zinc phosphate coating by using said zinc phosphate-coated substrate as a negative electrode and applying a direct current thereto, in the presence of an electrolyte solution comprising zinc ions in a concentration of 2 to 3 g/l, phosphate ions in a concentration of 8 to 14 g/l and chloride ions in a concentration of 3 to 6 g/l.

4,639,296

METHOD FOR FORMING ETHYLENE GLYCOL FROM SODIUM METHOXIDE

Ronald L. Cook, Aurora, Ill., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 31, 1986, Ser. No. 824,811
Int. Cl.[4] C25C 1/00
U.S. Cl. 204—59 R 8 Claims



1. A method for forming ethylene glycol from sodium methoxide comprising the steps of:

combining sodium methoxide with anhydrous methanol to form a mixture,

flowing the mixture past an anode and then past a cathode, and

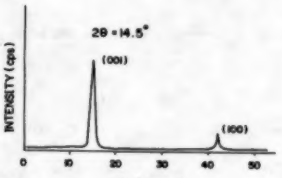
providing a DC voltage across the anode and the cathode so that the mixture yields ethylene glycol.

4,639,297

FLUORINATED GRAPHITES AND A PROCESS FOR PRODUCTION THEREOF

Kazumi Suematsu, Shizuoka, Japan; Kaoru Soutome, Pocatello, Id., and Tatsumi Arakawa, Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 584,992, Mar. 1, 1984, abandoned. This application Aug. 5, 1985, Ser. No. 763,067
Claims priority, application Japan, Mar. 16, 1983, 58-42230; Jun. 22, 1983, 58-110999; Jul. 19, 1983, 58-130355
Int. Cl.[4] C25C 1/00
U.S. Cl. 204—59 F 26 Claims



1. A process for producing a fluorinated graphite intercalation compound having the formula $(C_xF)_n$ wherein x is a numerical value of about 2.0 to about 5.5 and n refers to an indefinite number of recurring (C_xF) units and having a crystalline structure exhibiting a peak at about 13.7° to about 15.0° in terms of an angle of 2θ corresponding to the diffraction of the (001) plane in the X-ray diffraction pattern, a peak in the vicinity of 685.3 eV due to the F_{1S} and two peaks in the vicinity of 287.5 eV and 284.3 eV due to the C_{1S} in the spectrum of electron spectroscopy of chemical analysis, two peaks in the vicinity of 1100 cm^{-1} and 1240 cm^{-1} in the IR spectrum, an electric conductivity of at least about $10^{-8}\Omega^{-1}cm^{-1}$; and being thermally stable in air up to 200° C. from the viewpoint concerning a pattern of X-ray diffraction, which process comprises subjecting a carbon material to electrolysis in hydrogen fluoride at a voltage of about 6.5 V to about 15 V at a temperature of about −40° C. to about 100° C. in the presence of water or a metal fluoride for a sufficient time to fluorinate the carbon material throughout.

4,639,298

OXIDATION OF ORGANIC COMPOUNDS USING CERIC IONS IN AQUEOUS METHANESULFONIC ACID

Robert P. Krek, Jessup, and Robert M. Spotnitz, Catonsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 5, 1986, Ser. No. 859,548
Int. Cl.[4] C25B 3/02
U.S. Cl. 204—59 R 23 Claims

1. A process for forming carbonyl group containing compounds from their respective organic substrate selected from aromatic and alkylaromatic compounds comprising contacting the organic substrate with an aqueous solution containing ceric methanesulfonate in the presence of at least 1.5 molar concentration of free methanesulfonic acid, said solution being substantially free of extraneous anions of other acids and having at least 0.2 molar cerium concentration.

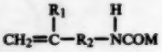
4,639,299
ACRYLIC AND ACRYLIC/EPOXY COPOLYMER COMPOSITION AS SELF-CURING CATHODIC ELECTROCOATING VEHICLES

Edward T. Turpin, Elyria, and David T. Thrane, Fairview Park, both of Ohio, assignors to SCM Corporation, New York, N.Y.

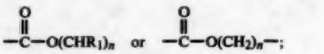
Filed Dec. 3, 1984, Ser. No. 677,341
Int. Cl.[4] C25D *13/06*
U.S. Cl. 204—181.7 **6 Claims**

1. A method of electrocoating an electrically conductive substrate serving as a cathode which comprises passing an electric current between said cathode and an anode in contact with an aqueous electrodepositable composition, wherein said composition comprises an acid solubilized, or dispersed self-curing amino cation-active aqueous polymer composition containing amino, hydroxyl and blocked isocyanate functionality derived from the polymerization of:

(a) at least 5 weight percent of a polymerizable blocked monoisocyanate having the formula:



wherein R_1 is hydrogen or C_{1-3} lower alkyl group; R_2 is diradical



n is 1 to 3; and M is an isocyanate blocking agent residue; said blocked monoisocyanate being copolymerized with

(b) 30 to 90 weight percent polymerizable vinyl comonomer comprising at least one member of the group consisting of acrylate and methacrylate esters, styrene, vinyl chloride, vinylidene chloride and vinyl acetate and wherein said acrylate or methacrylate esters are selected from alkyl, hydroxyalkyl, alkylaminoalkyl and dialkylaminoalkyl esters, wherein the weight percentages are based on the combined weights of (a) and (b) monomers and total 100 percent; and wherein said polymerization is carried out in the presence of

(c) 60 to 300 weight percent of an amine-epoxy adduct comprising the reaction product of an epoxide and an organic amine having at least one primary or secondary group reactive with said epoxide; and percent (c) being based on total weights of (a) and (b) monomers; and wherein the amine cation-activity is derived from monomer (b), amine-epoxy adduct (c) or combinations thereof sufficient to provide an amino-cation activity of from 35 to 175 milliequivalents per 100 gram resin solids and to effect polymer solubilization or dispersion on partial or full acidification.

4,639,300
METHOD AND APPARATUS FOR ELECTROFILTRATION

Joseph B. Culkin, Wilton, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

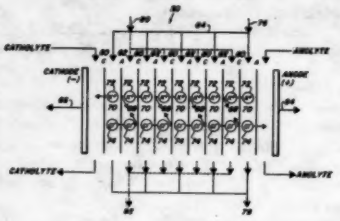
Filed May 21, 1985, Ser. No. 736,604
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.3 **12 Claims**

1. A process for dewatering a liquid suspension of solids subject to the influence of an electric field, which comprises the steps of:

(a) demineralizing the suspension of solids to lower the conductivity of the suspension;

(b) subjecting said suspension of solids which has been demineralized in step (a) to an electric field within an electrically augmented vacuum filter;

(c) concentrating said suspension of solids by forming a slurry or solids cake on an electrode surface of said electrically augmented vacuum filter; and

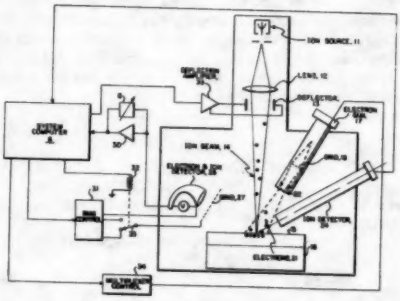


(d) removing the slurry or solids cake formed in step (c) from the electrode surface.

4,639,301
FOCUSED ION BEAM PROCESSING

John A. Doherty, Sudbury; Billy W. Ward, Rockport, and David C. Shaver, Carlisle, all of Mass., assignors to Micrion Limited Partnership, Beverly, Mass.

Filed Apr. 24, 1985, Ser. No. 726,713
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—192.31 **15 Claims**



1. Focused ion beam processing apparatus comprising,

a source of a finely focused ion beam of submicron shape for impingement upon a substrate surface in a predetermined surface plane,

a source of an electron beam,

and means for directing said electron beam toward said surface plane in a region embracing the target point in said surface plane intersected by said ion beam for neutralizing the surface charge in said surface plane otherwise produced thereat by said ion beam to reduce defocusing and undesired deflection of said ion beam in said surface plane to allow precise positioning of said ion beam on said target point and maintenance of said submicron shape of said ion beam on said target point.

4,639,302

ELECTROLYTIC CELL FOR RECOVERY OF METALS FROM METAL BEARING MATERIALS

Peter K. Everett, Chatswood, Australia, assignor to Dextec Metallurgical Pty. Ltd., New South Wales, Australia

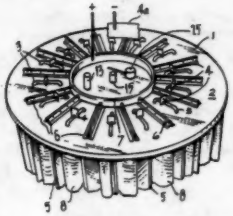
PCT No. PCT/AU83/00182, § 371 Date Jul. 26, 1984, § 102(e) Date Jul. 26, 1984, PCT Pub. No. WO84/02356, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 9, 1983, Ser. No. 638,485

Claims priority, application Australia, Dec. 10, 1982, PF7223

Int. Cl.[4] C25C 7/00, 7/08, 7/02

U.S. Cl. 204—258 30 Claims



1. An electrolytic cell for recovery of metal from mineral ores or concentrates comprising:

(a) a tank adapted to hold a slurry of electrolyte and said mineral ores or concentrates,

(b) means within the tank for agitating said slurry,

(c) a plurality of vertical anodes radially disposed in said tank,

(d) a plurality of vertical cathodes radially disposed in said tank and interposed between said anodes,

(e) porous diaphragm bag means which surround said radially disposed plurality of cathodes and separates said cathodes from the electrolyte slurry.

4,639,303

ELECTROLYSIS APPARATUS WITH HORIZONTALLY DISPOSED ELECTRODES

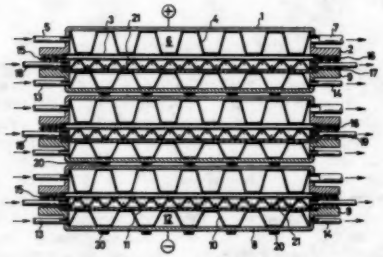
Rudolf Staab; Dieter Bergner, and Kurt Hannesen, all of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 24, 1985, Ser. No. 790,825

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1984, 3439265

Int. Cl.[4] C25B 9/00, 11/10, 13/00

U.S. Cl. 204—258 3 Claims



1. Electrolysis apparatus for preparing chlorine from aqueous alkali halide solutions comprising at least one electrolytic cell having an anode and a gas diffusion cathode both of which are horizontally disposed, a partition separating the anode and cathode from each other, a housing consisting of two half shells surrounding the anode and cathode, a mechanical and electrical connection between the anode and one of the half shells and a similar connection between the cathode and the other half shell, devices for feeding electrolytic starting materials into the housing and for removing products of electrolysis therefrom, a liquid-tight connection between the cathode and its half shell, a current supply and distribution device supporting the cathode in its half shell, a spacer extending between the cathode and the partition for supporting the partition, means holding the partition between the half shells, seal means sealing the partition from the anode shell, a circumferential frame between the shells connected to hold the spacer in its position, and inlet and outlet means in the frame for feeding and removing catholyte.

4,639,304

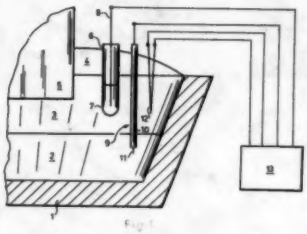
APPARATUS FOR DETERMINATION OF ALUMINUM OXIDE CONTENT OF THE CRYOLITE MELT IN ALUMINUM ELECTROLYSIS CELLS

Imre Báder; Endre Berecz, both of Miskolc; Gábor Szina, and János Horváth, both of Budapest, all of Hungary, assignors to Nehezipari Muszaki Egyetem, Hungary

Filed Nov. 1, 1985, Ser. No. 794,103

Int. Cl.[4] G01N 27/58

U.S. Cl. 204—413 2 Claims



1. An apparatus for determination of aluminium oxide content of a cryolite melt in aluminium electrolysis cells comprising an oxygen ion conducting solid electrolyte containing oxygen galvanic cell equipped with a reference electrode of given oxygen potential arranged in a zirconium oxide tube closed on one end and with a measuring electrode covered with aluminium, said measuring electrode comprising a conductor, said reference electrode being a cryolite melt supersaturated with Al_2O_3 and the aluminium coating of the measuring electrode being the aluminium melt in the cell into which the conductor of the electrode protrudes.

4,639,305

ELECTROCHEMICAL ELEMENT

Kazuyoshi Shibata, and Hitoshi Nishizawa, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 3, 1985, Ser. No. 740,430

Claims priority, application Japan, Jun. 6, 1984, 59-116227

Int. Cl.[4] G01N 27/58

U.S. Cl. 204—426 7 Claims

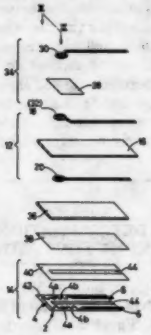
1. An electrochemical element comprising:

at least one electrochemical cell having a planar solid electrolyte body and a pair of electrodes held in contact with said planar solid electrolyte body;

at least one electrical heater layer which is located on one of opposite sides of the electrochemical cell, said heater layer comprising a heater member having a heat-generating portion shaped in a serpentine strip to heat at least a portion of said electrochemical cell at which said pair of electrodes are disposed, said serpentine strip being formed in a zig-zag fashion to provide a heating region in which said heat-generating portion is accommodated;

said heat-generating portion having a cross sectional area at central portions thereof located in a central portion of said heating region, which is greater than a cross sectional area

at a peripheral portions thereof located adjacent to a peripheral portion of said heating region, such that said



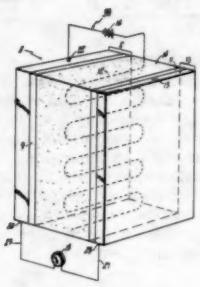
heat-generating portion provides a substantially uniform distribution of temperature throughout the heating region.

4,639,306

ELECTROCHEMICAL GAS SENSOR

Beth A. Tomasovic, New Kensington, and Robert L. Novack, Evans City, both of Pa., assignors to Bacharach, Inc., Pittsburgh, Pa.

Filed Sep. 20, 1985, Ser. No. 777,989
Int. Cl.[4] G01N *27/30, 27/46*
U.S. Cl. 204—432 3 Claims



1. An apparatus for the detection and measurement of a gaseous component in an object gas comprising:

a sensing electrode having a porous, electrically conductive substrate with a catalyst dispersed on one or more surfaces,

a counter electrode having a porous, electrically conductive substrate with a catalyst dispersed on one or more surfaces,

an electrolyte in contact with the catalytic surface of the sensing electrode and the catalytic surface of the counter electrode,

a reference electrode in contact with the electrolyte,

a means for supplying and maintaining an electrical potential between the sensing electrode substrate and the reference electrode, and

a means for measuring the current flow from the sensing electrode substrate to the counter electrode substrate resulting from the catalytic reaction of the gaseous component at the interface of the sensing electrode and the electrolyte, wherein said electrically conductive substrates have an electrical conductivity greater than 10 $ohm^{-1}cm^{-1}$ and a porosity greater than 10 percent.

4,639,307

METHOD FOR PRODUCING INDUSTRIAL ASPHALTS

Judson E. Goodrich, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1984, Ser. No. 646,397
Int. Cl.[4] C08L *95/00;* C10C *1/20, 3/02*
U.S. Cl. 208—44 1 Claim

1. A one-step method of producing an industrial asphalt from a petroleum residuum consisting essentially of mixing together without air-blowing and in a nitrogen atmosphere:

(a) a feed consisting essentially of a bituminous material having a viscosity of 65 to 180 centistokes at 350 degrees Fahrenheit and wherein said feed forms a single phase when mixed with 5 percent ferric chloride; and

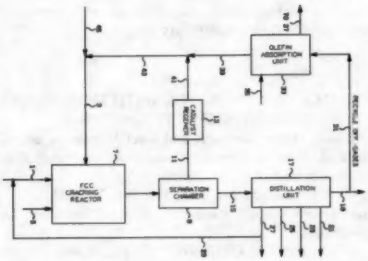
(b) from more than 0.5 to less than 10 percent by weight of ferric chloride, said mixing being done at a temperature in the range of 400 to 500 degrees Fahrenheit for from 5 to 25 minutes; whereby the softening point of the asphalt is substantially increased by 70 to 100 degrees Fahrenheit and the penetration is significantly decreased by at least 30 to 60 dmm at 77 degrees Fahrenheit thereby producing an industrial asphalt having a softening point in the range 200 to 235 degrees Fahrenheit and a penetration of 12 to 30.

4,639,308

CATALYTIC CRACKING PROCESS

Fu-Ming Lee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 16, 1986, Ser. No. 819,316
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—100 20 Claims



1. A catalytic cracking process comprising the steps of:

(A) contacting (a) an oil feed stream comprising hydrocarbons having more than ten carbon atoms per molecule with (b) a solid cracking catalyst, under such conditions as to obtain (c) gaseous products comprising hydrogen, paraffins having from 1–4 carbon atoms per molecule and olefins having from 2–4 carbon atoms per molecule and (d) at least one stream of substantially liquid products comprising hydrocarbons having an average molecular weight lower than that of the hydrocarbons in said feed stream;

(B) substantially separating said gaseous products from said at least one stream of substantially liquid products and said solid cracking catalyst;

(C) treating at least a portion of the separated gaseous product from step B under such conditions as to reduce therein the content of olefins having 2–4 carbon atoms per molecule;

(D) recycling and introducing at least a portion of said gaseous product stream having reduced olefin content

into the contacting zone of step A where said feed stream is contacted with said solid cracking catalyst, the recycle gaseous product stream comprising hydrogen and said paraffins;

(E) repeating steps A through D.

4,639,309

PROCESS FOR THE DEHALOGENATION OF POLYHALOGENATED HYDROCARBON CONTAINING FLUIDS

Jean-Marc Lalancette, Sherbrooke, and Germain Belanger, St-Germain de Grantham, both of Canada, assignors to Hydro-Quebec, Montreal, Canada

Filed Sep. 18, 1985, Ser. No. 777,300

Int. Cl.[4] C10G *17/00*

U.S. Cl. 208—262 **14 Claims**

1. In a process for the dehalogenation of polyhalogenated hydrocarbons from an oil containing same wherein the dehalogenation is carried out through the reaction of sodium or potassium, the improvement which comprises contacting a dispersion of sodium or potassium over the surface of a particulate inert material having a density of at least 2.0 with a polyhalogenated hydrocarbon contaminated hydrocarbon fluid, said mixture being in an inert atmosphere, heated to a temperature of at least 100° C. and under constant agitation whereby the sodium or potassium coated on the surface of the particulate inert material reacts with the halogen of the polyhalogenated hydrocarbon to form the corresponding sodium or potassium halide which is constantly removed from the active surface of the sodium or potassium by abrasion and recovering the hydrocarbon fluid substantially devoid of polyhalogenated hydrocarbon.

4,639,310

PROCESS FOR THE PRODUCTION OF REFORMER FEED AND HEATING OIL OR DIESEL OIL FROM COAL BY LIQUID-PHASE HYDROGENATION AND SUBSEQUENT GAS-PHASE HYDROGENATION

Werner Döhler, Marl; Ludwig Merz, Recklinghausen; Heinz Frohnert, Bottrop; Bernd Uckermann, Dortmund; Ulrich Graeser, Haltern; Alfons Jankowski, Essen; Eckard Wolowski, Mülheim-Ruhr; Hans-Friedrich Tamm, Recklinghausen, and Norbert Wilczok, Mülheim, all of Fed. Rep. of Germany, assignors to Veba Oel Entwicklungs-Gesellschaft, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 761,681

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428783; May 4, 1985, 3516084

Int. Cl.[4] C10G *1/00, 1/06*

U.S. Cl. 208—412 **17 Claims**

1. A process for the production of reformer feed and heating oil or diesel oil from coal, which comprises:

(i) introducing a pulverized coal-oil slurry together with a hydrogenation gas into a liquid-phase hydrogenation stage;

(ii) removing a solids-containing residue from the discharge of the said liquid-phase hydrogenation stage;

(iii) cooling the resulting residue-free volatile coal-oil fraction from the said discharge;

(iv) feeding the said volatile coal-oil fraction to a gas-phase hydrogenation stage;

(v) introducing fresh hydrogen which is substantially free of contaminants into the said gas-phase hydrogenation stage together with the said volatile coal-oil fraction, said fresh hydrogen introduced in the said gas-phase hydrogenation stage constituting the entire amount of hydrogen required for the said process; and

(vi) utilizing the waste-gas from the said gas-phase hydrogenation as the hydrogenation gas for the said liquid-phase hydrogenation.

4,639,311

DEVICE FOR SEPARATING AIRBORNE PARTICLES INTO GRAIN SIZE CLASSES

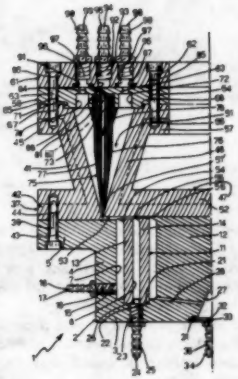
Vittorio Prodi, Via Martinelli, 7, 40137 Bologna, Italy

Filed Apr. 16, 1985, Ser. No. 723,670

Claims priority, application Italy, Apr. 19, 1984, 3433 A/84

Int. Cl.[4] B07B *7/086*

U.S. Cl. 209—143 **13 Claims**



1. A device employing a source of filtered air and means to create a negative pressure for separating from a source of suspensoids airborne particles, such as an aerosol, into a plurality of suspensoids of airborne particles each containing particles of predetermined grain size classes, comprising:

a first body including a base wall having extending transversely therefrom a side wall, a first and second dividing wall and a third wall, said side wall and said first dividing wall defining between them a first chamber, a second chamber being defined between said first and second dividing wall, said second dividing wall and said third wall defining a third chamber, said base wall having an outlet opening communicating with each of said first, second, and third chambers and outlet means adapted to separately connect said means to create a negative pressure to at least one of said first, second and third chamber outlets;

a second upper body defining a first cavity having an inlet opening communicating with said source of filtered air, the connection of said second body to said first body defining a second cavity and an elbow passage way at one end of said second cavity providing a communication between said first and second cavities, said first, second, and third chambers being open to and communicating with said second cavity at the other end thereof; and

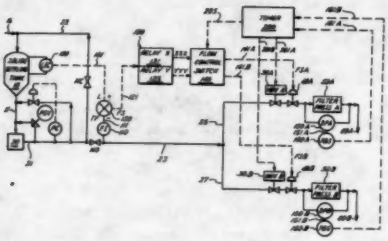
a nozzle positioned in said first cavity in said first cavity and adapted to be connected to said source of suspensoids and operable to eject said suspensoides through said elbow passageway, said nozzle being positioned and said elbow joint being curved in such a way that the suspensoids after having traversed said elbow passageway separate into a plurality of grain size classes each flowing into a predetermined one of said first, second and third chambers in dependence on the magnitude of negative pressure formed therein.

4,639,312

FILTER PRESS FLOW CONTROL SYSTEM FOR DEWATERING SLUDGE

Deborah E. R. Quock, Houston; Timothy L. Triplett, Missouri City, and Don E. Childress, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 3, 1985, Ser. No. 783,720
Int. Cl.[4] B01D *25/12*
U.S. Cl. 210—101 1 Claim



1. A system for controlling the flow of settled solids from a solids settling tank to a pair of filter presses; filter press A and filter press B, the solids settling tank supplied with sludge consisting of solids and aqueous fluid; the system comprising:

A. a plurality of sensors comprising:

1. a first sensor providing a signal corresponding to the sensed settled solids/aqueous fluid interface level, L, in the solids settling tank and providing a signal corresponding thereto,

2. a second sensor sensing the total flow of settled solids from the solids settling tank, FT, to the filter presses and providing a signal corresponding thereto,

3. a third pair of sensors sensing the pressure differential across each filter press, DPA being the pressure differential across filter press A and DPB being the pressure differential across filter press B, and providing signals corresponding thereto,

B. a plurality of valves comprising:

1. a pair of flow control valves for controlling the flow rate of settled solids to the filter presses, flow control valve A controlling the flow rate to filter press A receiving as an input flow control valve A activating signal, FSA, and flow control valve B controlling the flow rate to filter press B receiving as an input flow control valve B activating signal, FSB,

2. a pair of motor operated valves for blocking flow to the filter presses, motor operated valve A up-stream of flow control valve A and motor operated valve B up-stream of flow control valve B,

C. a flow controller receiving both signal, L, from the first sensor corresponding to a reference input and signal, FT, from the second sensor corresponding to a feedback variable and providing a flow control valve actuating signal, FS, proportional to the difference between the reference input and the feedback variable,

D. a relay means comprising two amplifying relays, relay x providing signal xxx and relay y providing signal yyy, the amplifying relays adjusting the respective signals such that as control valve actuating signal FS varies from 0% to 50%, signal xxx varies linearly from 0% to 100% and signal yyy remains constant at 0%; and as control valve actuating signal FS varies from 50% to 100%, signal xxx remains constant at 100% and signal yyy varies linearly from 0% to 100%;

E. a flow control switch receiving as inputs a flow control switch actuating signal, signal xxx from relay x and signal yyy from relay y; and in mode one providing signal xxx, as output signal FSA, and signal yyy, as output signal FSB, and in mode two providing signal xxx, as output signal FSB, and signal yyy, as output signal FSA, alternating between mode one and mode two on receipt of a flow control switch activating signal,

F. pressure switch means receiving as inputs, the signals corresponding to the pressure differential across each filter press, DPA and DPB, and at a predetermined pressure differential, providing as an output a timer actuating signal,

G. a timer receiving as an input the timer actuating signal and providing as outputs:

i. an actuating signal to open the motor operated valve up-stream of the flow control valve receiving the varying control valve actuating signal,

ii. an actuating signal; after a predetermined time period, to close the motor operated valve up-stream of the flow control valve receiving the constant control valve actuating signal, and simultaneously

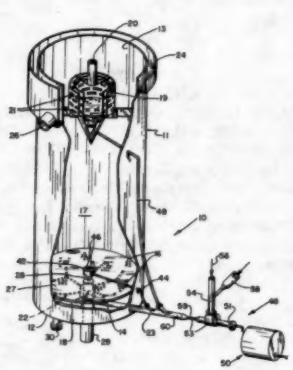
iii. the flow control switch actuating signal to the flow control switch.

4,639,313

FLOATATION APPARATUS FOR CONCENTRATION OF MINERALS FROM HIGH WATER CONTENT AQUEOUS SLURRIES

Donald E. Zipperian, Tucson, Ariz., assignor to The Deister Concentrator Company, Fort Wayne, Ind.

Filed Jul. 5, 1985, Ser. No. 752,465
Int. Cl.[4] B03D *1/24*
U.S. Cl. 209—170 17 Claims



17. In an apparatus for separation of minerals by froth flotation from an aqueous pulp containing a mixture of mineral and gangue particles, said apparatus including means for removing a froth of a float fraction of the aqueous pulp at a substantially continuous rate, and a hydraulic compartment wherein aerated water is distributed substantially uniformly to provide levitating air bubbles for upward passage through said aqueous pulp producing said froth, the improvement comprising:

means for providing a controllably flowing stream of pressurized air;

water supply means;

means for aspirating a controllable quantity of water into said flowing steam of said pressurized air, said aspiration resulting from the flow of said stream of pressurized air;

means for controllably introducing a flow of surfactant into said quantity of water aspirated; and

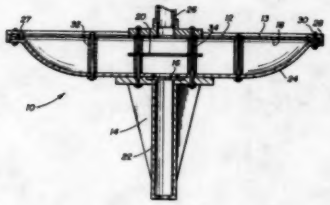
means for turbulently mixing said flowing stream of pressurized air, said aspirated water, and said surfactant to produce a stream of aerated water for delivery to said hydraulic compartment.

4,639,314

FINE BUBBLE DIFFUSER AND DIFFUSER SYSTEM HAVING FILTERED BLOW-DOWN TUBE

Robert R. Tyer, 15722 Brookvilla, Houston, Tex. 77059

Filed Jan. 18, 1985, Ser. No. 692,919
Int. Cl.[4] B01F 3/04
U.S. Cl. 210—220 12 Claims



1. In a gas diffuser system for a vessel having at least one gas diffuser element connected to a gas supply pipe, the improvement comprising:

(a) At least one tube connected to the system, the tube extending in a downward direction from the system and having an opening to the vessel located in predetermined distance below the level of the diffuser element, and the tube communicating with the system through an upper end; and

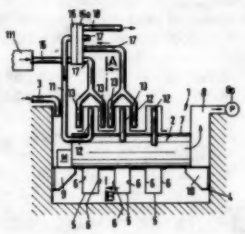
(b) a filter extending across the tube and having pores sized to exclude from the interior portions of the system solid material suspended in liquid material entering the tube through its opening to the vessel.

4,639,315

APPARATUS FOR MECHANICAL PURIFICATION OF WASTE WATER

Ernst Fuchs, Schmerikon, and Karl Fitzi, Hombrechtikon, both of Switzerland, assignors to Mecapec S.A., Schmerikon/SG, Switzerland

Filed Oct. 15, 1985, Ser. No. 787,620
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438170
Int. Cl.[4] B01D 23/24, 29/38
U.S. Cl. 210—333.1 17 Claims



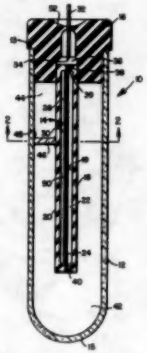
1. Apparatus for mechanical purification of waste water, particularly of water which has undergone a biological purification, comprising a vessel for a supply of waste water; a hollow support; at least one hollow drum-shaped frame rotatably mounted on and surrounding said support, said frame having at least one opening at least a portion of which is immersed into waste water in said vessel during each revolution of said frame about said support; filter means including a foraminous filter mounted in said frame and having an inner side overlying said opening and an outer side which intercepts impurities contained in waste water entering said frame by way of said filter and said opening; means for withdrawing the thus purified water from the interior of said frame; a source of clean water; a feeding device operable to supply clean water from said source into the interior of said frame and having a stationary portion arranged to direct clean water against successive portions of the inner side of said filter as the filter rotates with said frame around said support; and suction generating means including a portion adjacent to the outer side of said filter opposite said portion of said feeding device and actuatable to collect impurities which are expelled from the filter by clean water in response to operation of said feeding device, said portion of said feeding device cooperating with said portion of said suction generating means to maintain the permeability of said filter above a preselected minimum acceptable value for extended intervals of time.

4,639,316

AUTOMATIC LIQUID COMPONENT SEPARATOR

Mourad M. Eldegheidy, Raleigh, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Dec. 14, 1984, Ser. No. 681,771
Int. Cl.[4] B01D 13/00
U.S. Cl. 210—416.1 9 Claims



1. A device for the immediate separation of a blood sample into a cell containing and a cell free fraction of said blood sample characterized by

(a) an elongated cylindrical tube having a closed end and an open end;

(b) said tube defining an evacuated chamber;

(c) an elastomeric stopper sealingly closing said open end, said stopper having a bottom surface;

(d) a recess in the bottom surface of said stopper facing said evacuated chamber, said recess defining a sample receiving area;

(e) a flat elongated separation assembly in said evacuated chamber;

(f) said separation assembly positioned in said evacuated chamber to extend from said closed end of said tube to a point spaced from the open end thereof and having a length extending along the central axis of said tube;

(g) said separation assembly separating said evacuated chamber into a cell free fraction receiving chamber and a cell containing fraction receiving chamber;

(h) said elongated separation assembly comprising

(1) a pair of spaced apart elongated walls;

(2) said spaced apart walls defining a blood sample collection passage therebetween;

(3) the first of said spaced walls containing a cell free fraction receiving distributor panel;

(4) the second of said spaced walls containing a sample distribution chamber having first and second ends;

(5) said sample distribution chamber connected to said sample receiving area at said first end and to said cell

containing fraction receiving chamber at said second end;

(6) a membrane separator positioned in said blood sample collection passage and extending along the length thereof;

(7) said membrane separator having one side adjacent said cell free fraction receiving distributor panel and one side adjacent said sample distribution chamber;

(8) said cell free fraction distributor panel having a plurality of spaced apart channels therein for receiving a cell free fraction passing through said membrane separator; and

(9) means providing flow communication between said channels and said cell free fraction receiving chamber.

4,639,317

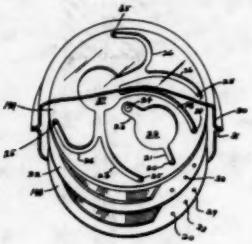
PLASMAPHERESIS FILTRATION MODULE HAVING IMPROVED SEALING MEANS

Robert P. Luoma, II, Newark, Del., and Frank M. Willis, Wenonah, N.J., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Feb. 16, 1982, Ser. No. 349,370

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—433.2 **15 Claims**



1. Plasmapheresis filtration module comprising a plasma side support having a blood inlet sealing surface, a blood side support having a multiplicity of blood flow channels around the periphery of a blood inlet, and a planar membrane pressed between the plasma side support and the blood side support, the blood flow channels being opposite the inlet sealing surface so that blood flows on the blood side, but not on the plasma side, of the membrane, said module being circular and having a central inlet with a generally radial blood flow path extending therefrom between the blood side support and the membrane, wherein said module the plasma side support has generally radial plasma flow channels extending from the inlet sealing surface to a plasma collection channel and the blood flow channels extend radially from the inlet to a plasma-depleted blood collection channel, and wherein said module the entrances to the blood flow channels uniformly decrease in depth from greater than about 15 mils (0.4 mm) to about 4 to 15 mils (0.1 to 0.4 mm) and the initial width of the entrances is about 4 to 20 mils (0.1 to 0.5 mm).

4,639,318

TUBULAR FILTER PRIMARILY INTENDED FOR FILTRATION OF LIQUIDS

Ralf G. Andersson, Ödakra, Sweden, assignor to Gullfiber AB, Billesholm, Sweden

PCT No. PCT/SE84/00085, § 371 Date Nov. 7, 1984, § 102(e) Date Nov. 7, 1984, PCT Pub. No. WO84/03450, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 8, 1984, Ser. No. 679,043

Claims priority, application Sweden, Mar. 9, 1983, 8301282

Int. Cl.⁴ B01D *27/00, 39/14*

U.S. Cl. 210—491 **10 Claims**

1. A tubular filter primarily intended for filtration of liquid flowing substantially radially towards the interior of the filter comprising in combination an inner filter layer of mineral wool, the fibres of which are oriented substantially concentrically to the tube axis, and an outer layer, of mineral wool, the

fibres of which are oriented substantially radially to the tube axis, the density of the filter increasing from the outer surface of the outer layer to the inner surface of the inner layer, the increase being continuous in the outer layer.

4,639,319

ELECTROLYTE STABILIZATION OF LATICES

Lutz Schellenberg, Cologne; Matthias Hamacher, Huerth-Gleul, both of Fed. Rep. of Germany, and Bashir M. Ahmed, Ambler, Pa., assignors to Gerhard Collardin GmbH, Cologne, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,597

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431276

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—651 **19 Claims**

1. A method for stablizing the electrolyte content of acidic aqueous resin latex composition baths for autodeposition comprising:

introducing said latex composition into flowing contact with the outer surface of a filtration membrane whose pore size is at least small enough to prevent substantially all latex resin particles from passing through;

flowing at least partially deionized water along the inner surface of said filtration membrane in a closed circuit at a sufficient flow rate to generate a pressure differential of about 40 to 500 mbar between said membrane's outer and inner surfaces, thereby removing water and a portion of the soluble electrolytes from said latex composition and adding the same to said flowing at least partially deionized water; and

replenishing a volume of deionized water to said bath equal to the volme removed by filtration.

4,639,320

METHOD FOR EXTRACTING WATER FROM SOLID FINES OR THE LIKE

Lloyd B. Smith, Bristol, Tenn., assignor to United Coal Company, Bristol, Va.

Continuation-in-part of Ser. No. 720,554, Apr. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 436,735, Oct. 26, 1982, abandoned. This application Feb. 19, 1986, Ser. No. 831,056

Int. Cl.⁴ B04B *1/06*

U.S. Cl. 210—739 **4 Claims**

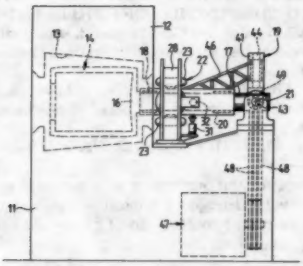
1. A method for centrifugally removing fluid from wet particulate matter comprising the steps of:

(a) introducing said wet particulate matter into a batch-type centrifuge having a bowl with an opening at one end for

receiving said wet particulate matter, a base support at the other end thereof attached to a driven shaft rotatable at variable speeds and a filter media liner proximal the inner surface of said bowl for fluid to be centrifugally extracted from said wet particulate matter;

(b) supporting said shaft on a gimbal-like system at the end thereof distal said bowl to maintain a vertex of precession of said shaft and bowl within a well defined locus and to constrain said shaft to pivotal motion about said vertex, such that the freedom of movement of said bowl and shaft is limited to directions transverse to the axis of rotation thereof;

(c) supporting said shaft proximal said bowl on supports of variable resiliency;



(d) accelerating the rotational speed of said centrifuge to a controlled drying speed to reduce the moisture content of said particulate matter to below a predetermined percentage by centrifugal extraction of the fluids;

(e) decelerating the rotational speed of said centrifuge;

(f) removing the particulate matter from the centrifuge at controlled rotational speeds of said centrifuge; and

(g) controlling the natural radial frequency fn of said centrifuge by varying the resiliency of said supports of variable resiliency in accordance with the rotational speed f of said centrifuge such that the ratio f/fn becomes 1.0 only during said accelerating and decelerating steps and the interval of time during which the condition f/fn equals 1.0 is insufficient to induce excessive radial vibration in said centrifuge.

4,639,321

LIQUID DETERGENT COMPOSITIONS CONTAINING ORGANO-FUNCTIONAL POLYSILOXANES

Christian R. Barrat, Brussels; Alfred Busch, Strombeek-Bever, both of Belgium, and Kosmas Sardelis, Athens, Greece, assignors to The Procter and Gamble Company, Cincinnati, Ohio

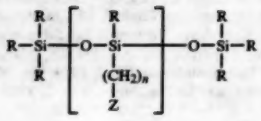
Filed Jan. 22, 1985, Ser. No. 693,322
Int. Cl.[4] D06M *11/00*
U.S. Cl. 252—8.8 **15 Claims**

1. A liquid detergent composition capable of providing desirable textile benefits inclusive of softness, containing:

(a) from 5% to 70% by weight of a surface-active agent selected from the group of anionic, nonionic, amphoteric and zwitterionic surface-active agents and mixtures thereof;

(b) a liquid carrier; and

(c) from 0.05% to 5% by weight of an organo-functional poly-di-C_{1-4}-alkyl siloxane textile treatment agent having the general formula:

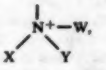


wherein

R=C_{1-4}-alkyl; n is an integer from 1 to 6;

Z is

whereby X and Y are, selected independently, —H; —C_{1-30}-alkyl; —C_6-aryl; —C_{5-6}-cycloalkyl; —C_{1-6}—NH_2; —CO—R; with the proviso that the nitrogen can be quaternized such as to represent



whereby W can be selected from X or Y; or

Z is

whereby P and M are —COOH; —CO—NR'_2; or C_{1-2}-alkyl;

with the further proviso that the degree of substitution, i.e., the molar proportion of silicones carrying a substituent other than a C_{1-4}-alkyl group to total silicones is in the range from 0.01 to 0.7.

4,639,322

BIOPOLYMER COMPOSITIONS HAVING ENHANCED FILTERABILITY

Donald Beck, Ledyard; James W. Miller, Mystic; William C. Wernau, Groton, and Thomas B. Young, III, North Stonington, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 548,473, Nov. 3, 1983, abandoned. This application Aug. 27, 1984, Ser. No. 644,593
Int. Cl.[4] E21B *43/22*
U.S. Cl. 252—8.554 **22 Claims**

1. A composition for use in enhanced oil recovery comprising from about 1.5–20 weight percent Xanthomonas biopolymer in the form of whole Xanthomonas fermentation broth or concentrated Xanthomonas fermentation broth and from about 0.0008–3 weight percent methylene bis(thiocyanate), said amount of methylene bis(thiocyanate) sufficient to lyse Xanthomonas cells, said composition having a pH above about 3.5.

4,639,323

WATER SOLUBLE METALWORKING FLUIDS

Tsong K. Liao, Jackson County, Mo., assignor to Nihon Kohsakuyu Company, Ltd., Japan

Continuation-in-part of Ser. No. 474,305, Mar. 11, 1983, abandoned. This application Jul. 2, 1984, Ser. No. 627,086
Claims priority, application Japan, Feb. 2, 1983, 58-014588
Int. Cl.[4] C10M *103/00*
U.S. Cl. 252—32.5 11 Claims

1. A composition for use as an active ingredient in a metalworking fluid, said composition comprising:

80–95% by weight disodium phosphate heptahydrate; and

5–20% by weight of a fluorinated hydrocarbon surfactant.

4,639,324

LUBRICATING COMPOSITIONS

William Y. Lam, Ballwin, Mo., assignor to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Filed Jul. 8, 1985, Ser. No. 752,509
Int. Cl.[4] C16M *129/68*
U.S. Cl. 252—48.6 72 Claims

1. A lubricating oil additive prepared by the process comprising:

(A) in a first stage reacting at about 140°–180° C. a mixture comprising 100 parts by weight of at least one aliphatic olefinically unsaturated hydrocarbon containing from about 8 to 36 carbon atoms and about 1 to 160 parts by weight of at least one fatty acid ester with elemental sulfur to obtain an intermediate, and

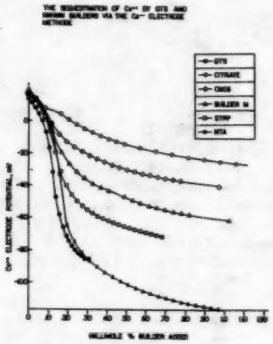
(B) in a second stage reacting at about 110°–140° C., said intermediate with additional sulfur and from about 25 to 100 parts by weight based on the total weight of combined said aliphatic olefinically unsaturated hydrocarbon and said fatty acid ester, a dimer of cyclopentadiene or lower C_{1-4} alkyl substituted cyclopentadiene dimer.

4,639,325

DETERGENT BUILDER

Vivian B. Valenty, Schenectady, N.Y.; William H. Hill, Cedar City, Utah, and Prasad S. Ravi, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Del.

Continuation-in-part of Ser. No. 664,451, Oct. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 575,421, Jan. 31, 1984, Pat. No. 4,524,009. This application Feb. 14, 1986, Ser. No. 829,678
Int. Cl.[4] C11D *1/08*
U.S. Cl. 252—89.1 37 Claims



1. A compound of the formula:

$$[MOOCCH_2(MOOC)CHOCH_2]_2CHOCH(COOM)CH_2COOM \quad (I)$$

wherein M is a salt-forming cation or hydrogen or mixtures thereof.

2. A compound of the formula:

$$HOCH_2CH[OCH(COOM)CH_2COOM]CH_2OH \quad (V)$$

wherein M is a salt-forming cation or hydrogen or mixtures thereof.

4,639,326

PROCESS FOR THE PREPARATION OF A POWDER DETERGENT COMPOSITION OF HIGH BULK DENSITY

Klaus Czempik, Verden, and Gerd Stremmel, Brühl, both of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 3, 1985, Ser. No. 752,344
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424987
Int. Cl.[4] C11D *1/83, 3/075, 11/00, 11/02*
U.S. Cl. 252—91 5 Claims

1. A process for the preparation of a nonionic surfactant-containing powder detergent composition having a total surfactant content from 5 to 15% and of greater than 0.60 kg/l bulk density, comprising the steps of:

(a) spray-drying a base powder comprising from about 4% to about 6% by weight of said detergent composition of a nonionic surfactant;

(b) spraying onto said base powder a further amount of nonionic surfactant in an amount from about 4% up to not more than half of the total nonionic content by weight of said detergent composition;

(c) subsequent to step (b) adding a final amount of nonionic surfactant obtained by granulation with a carrier, the amounts of said surfactant and carrier being from about 2.85 to 4.0% and being about 22%, respectively, by weight of said detergent composition; and

(d) subsequently adding adjunct detergent components to the base powder, said base powder being essentially free of sodium sulfate and the carrier for the nonionic surfactant comprising a mixture of zeolite and alkali metal perborate monohydrate in the amount of about 3 to 4% and about 8.5%, respectively, by weight of said detergent composition; said base powder and nonionic containing granulated carrier being present from about 59% and about 26%, respectively, by weight of said detergent composition.

4,639,327

COMPOSITION AND METHOD FOR CLEANING PAINTED SURFACES

Larry E. McGaha, P.O. Box 21, Clinton, Mont. 59825

Filed Jun. 20, 1985, Ser. No. 746,783
Int. Cl.[4] C11D *7/08, 7/50*
U.S. Cl. 252—143 2 Claims

1. A liquid cleaning composition for cleaning painted surfaces comprising:

i. 10 to 90 parts of a fixed oil taken from the group consisting of linseed oil, tung oil and sunflower oil,

ii. 10 to 90 parts of an alcohol taken from the group consisting of methanol, ethanol and isopropyl alcohol,

iii. 1 to 5 parts of a carboxylic acid, the total of (i), (ii) and (iii) being 100 parts.

4,639,328

THIENOTHIOPHENE DERIVATIVES

Joachim Krause, Dieburg; Michael Römer, Rodgau, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,891

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342631

Int. Cl.[4] C09K 3/34; G02F 1/13; C07D 409/00

U.S. Cl. 252—299.61 18 Claims

1. A liquid crystalline phase comprising at least two liquid-crystal components, wherein at least one component is of the formula

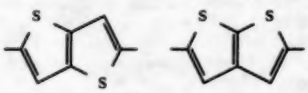
$$R^1-(A^1)_m-Z^1-A-(Z^2-A^2)_n-R^2$$

wherein

R^1 and R^2 are independently each H, alkyl of 1–12 C-atoms, or alkyl of 1–12 C-atoms, in which one or two non-adjacent CH_2 groups are replaced by an oxa atom, —CO— or —CH=CH—, in each case the resultant groups having 1–12 C— and oxa atoms in total, or independently are each F, Cl, Br, CN, —COOR or —O—COR;

A^1 and A^2 are independently each 1,4-phenylene, 1,4-cyclohexylene, 1,3-dioxane-2,5-diyl, 1,3-dithiane-2,5-diyl, tetrahydropyran-2,5-diyl, pyridazine-3,6-diyl or the corresponding N-oxide, piperidine-1,4-diyl, 1,4-bicyclo[2.2.-2]octylene or pyrimidine-2,5-diyl each of which is unsubstituted or substituted by one or two of F, Cl, Br, CN or CH_3;

A is a group of the formula 1 or 2



1 2

each of which is unsubstituted or substituted by one or two Cl or Br atoms;

Z^1 and Z^2 are independently each —CO—O—, —O—CO—, —CH_2CH_2—, —OCH_2—, —CH_2O— or a single bond;

R is alkyl of 1–10 C-atoms;

m is 1 or 2;

n is 0 or 1; and

when m is 2, the two groups A^1 are identical or different.

4,639,329

FUNCTIONAL ORGANIC-INORGANIC COMPOSITE AMORPHOUS MATERIAL AND PROCESS FOR ITS PRODUCTION

Akio Makishima, Sakuramura, and Toshiro Tani, Ibaraki, both of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki and Agency of Industrial Science and Technology, Tokyo, both of, Japan

Filed Sep. 19, 1985, Ser. No. 777,492

Claims priority, application Japan, Sep. 19, 1984, 59-196360

Int. Cl.[4] H01C 13/00

U.S. Cl. 252—501.1 5 Claims

1. A process for producing a functional organic-inorganic composite amorphous material, which comprises adding to an organic metal compound of silicon or germanium capable of being made amorphous by hydrolysis and dehydrating condensation, functional organic molecules soluble in a solvent capable of dissolving said organic metal compound, said functional organic molecules being selected from the group consisting of xanthene, coumarin, conjugated polyene, acridine, condensed polycyclic aromatic hydrocarbon, porphyrin, naphthoquinone and anthraquinone molecules, together with said solvent, adjusting the pH to a level of from 7 to 3, and then suojecting the mixture to hydrolysis followed by dehydrating condensation to form an integrated composite.

4,639,330

ALKYL-SUBSTITUTED SPIRODECENONE DERIVATIVES, ORGANOLEPTIC UTILITY THEREOF AND PROCESSES FOR PREPARING SAME

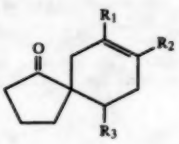
Mark A. Sprecker, Sea Bright, and Marie R. Hanna, Hazlet, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 21, 1986, Ser. No. 842,207

Int. Cl.[4] A61K 7/46

U.S. Cl. 252—522 R 15 Claims

1. An alkyl-substituted spirodecenone derivative defined according to the structure:



wherein one of R_1 or R_2 is methyl and the other of R_1 or R_2 is hydrogen; and wherein R_3 represents C_3–C_4 alkyl.

4,639,331

PROCESS FOR MAKING PULVERULENT AMMONIUM POLYPHOSPHATES STABLE TO HYDROLYSIS

Georg Elsner, Hürth; Horst Staendeke, Lohmar, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 603,120

Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316880

Int. Cl.[4] C09K 21/04, 21/10; C08K 3/28, 3/32

U.S. Cl. 252—609 8 Claims

1. Process for making a particulate, free-flowing, pulverulent ammonium polyphosphate of the general formula

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

in which n stands for a whole number having an average value of about 20 to 800 and the m/n ratio is about 1, wherein 75 to 99 parts by weight ammonium polyphosphate are encapsulated with 1 to 25 parts by weight melamine/formaldehyde-resin or phenol/formaldehyde-resin, which comprises:

placing particulate ammonium polyphosphate, an aliphatic C_1–C_4 alcohol as a diluent, and melamine/formaldehyde-resin or phenol/formaldehyde-resin in an autoclave and initmately mixing them as a suspension at room tempera-

ture therein, heating the suspension to a temperature of 80° to 180° C., allowing the mixture to remain over a period of 15 to 240 minutes at that temperature, cooling the mixture to room temperature, separating the alcohol and dring the product so obtained.

4,639,332
PROCESS FOR THE PREPARATION OF INSULIN DERIVATIVES

Ulrich Grau, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

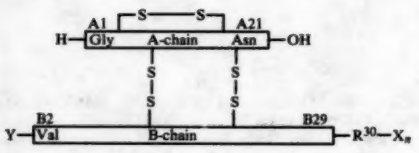
Filed Aug. 1, 1984, Ser. No. 636,672

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3327928

Int. Cl.⁴ C07K *7/40*

U.S. Cl. 530—303 **10 Claims**

1. A process for the preparation of an insulin derivative of the formula I



(I)

in which

R^{30} represents the radical of a neutral L-amino acid selected from the group consisting of Ala, Thr, and Ser,

n=1, 2 or 3,

X represents identical or different radicals of naturally occurring L-amino acids which can be genetically coded, at least one of which is a basic amino acid, and, where n is 2 or 3, the C-terminal member may also be homoserine-lactone,

Y=Phe or H

by splitting of proinsulin intermediates, proinsulin, preproinsulin or analogs thereof, which comprises carrying out the splitting reaction at a pH in the range from 1 pH unit below the isoelectric point of each individual insulin derivative of the formula I to 1 pH unit above said isoelectric point in the presence of at least one phenol.

4,639,333
PROCESS FOR CONVERTING PREPROINSULIN ANALOGS INTO INSULINS

Rainer Obermeier, Hattersheim am Main; Rolf Geiger, Frankfurt am Main, and Ulrich Grau, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

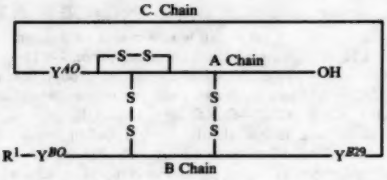
Continuation of Ser. No. 474,458, Mar. 11, 1983. This application Oct. 12, 1984, Ser. No. 659,865

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209184

Int. Cl.⁴ C07K *7/40*

U.S. Cl. 530—303 **16 Claims**

1. A process for the preparation of insulin from a synthetic analog of human, bovine or procine preproinsulin of the formula I



(I)

in which Y denotes Lys or Arg and R^1 denotes hydrogen, an L-amino acid or a peptide residue capable of serving as a signal sequence, which comprises reacting such preproinsulin analog, in a solvent system consisting of water and acetic acid at a pH below the isoelectric point of the insulin in the presence of trypsin or a trypsin-like endopeptidase, with an amino acid derivative selected from the group consisting of Ala-OtBu, Thr-OMe, Thr-OtBu and Thr(tBu)OtBu and then cleaving off the ester group and other protective groups which may be optionally present.

4,639,334
PREPARATION OF 1-BENZYLAZETIDINE-3-OL DERIVATIVES

Derek A. Wood, Sittingbourne, and Paul H. Briner, Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed May 9, 1985, Ser. No. 732,214

Claims priority, application United Kingdom, May 18, 1984, 8412814

Int. Cl.⁴ C07D *205/04*

U.S. Cl. 548—952 **5 Claims**

1. A process for the preparation of 1-benzylazetidin-3-ol that comprises the step of cyclizing N-benzyl-3-amino-1-chloropropan-2-ol, in solution in triethylamine and optionally in the presence of a phase transfer catalyst.

4,639,335
STEREOCONTROLLED ACETOXYAZETIDINONE PROCESS

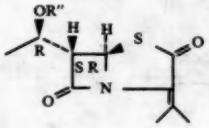
Alain Martel, Delson, and Jean-Paul Daris, St-Hubert, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 597,765, Apr. 6, 1984. This application Jan. 13, 1986, Ser. No. 818,145

Int. Cl.[4] C07D *499/00*; A61K *31/425*

U.S. Cl. 540—304 11 Claims

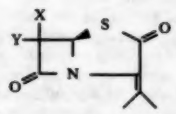
1. A process for the preparation of an intermediate of the formula



IIIb

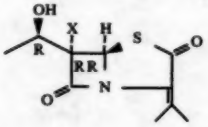
wherein R″ is a conventional hydroxy-protecting group selected from triisopropylsilyl, t-butyldimethylsilyl or t-butyldiphenylsilyl, which comprises the steps of

(a) reacting a 6,6-disubstituted anhydropenicillin of the formula



V

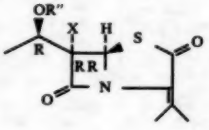
wherein X and Y are each independently chloro, bromo, iodo or phenylseleno with a reagent selected from a Grignard reagent of the formula R_1MgX or an organolithium compound of the formula R_1Li in which R_1 is (lower alkyl or C_6–C_{10} aryl and X is as defined above in an anhydrous inert organic solvent and at a temperature in the range of about 0° to −78° C. and subsequently adding acetaldehyde to exclusively produce the cis isomer of the formula



IIa

wherein X is as defined above:

(b) converting intermediate IIa to the corresponding intermediate of the formula



IIb

wherein R″ and X are as defined above; and

(c) subjecting intermediate IIb to reduction in an inert solvent and isolating the so-produced 5,6-trans isomer of the formula

IIIb

wherein R″ is as defined above.

4,639,336
NOVEL RADIOACTIVE ESTRADIENES LABELLED WITH IODINE

Alain Jouquey; Jean Salmon; Michel Mouren, and Gaëtan Touyer, all of Paris, France, assignors to Roussel Uclaf, Paris, France

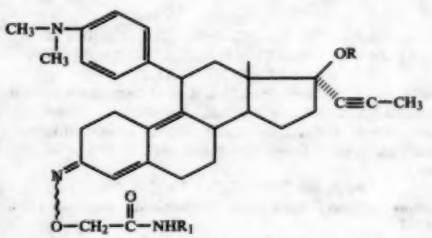
Filed Jun. 14, 1984, Ser. No. 620,455

Claims priority, application France, Jun. 14, 1983, 83 09812; Jun. 20, 1983, 83 10142

Int. Cl.[4] C07J *1/00*

U.S. Cl. 260—397.5 15 Claims

1. A radioactive estradiene labelled with iodine of the formula



I

in the form of their sync or anti isomers or mixtures thereof wherein the wavy line indicates anti or syn position, R is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and acyl of an organic carboxylic acid of 1 to 12 carbon atoms and R_1 is the residue of an an amino acid R_1NH_2 possessing an iodine acceptor group or a derivative thereof labelled with iodine[125] or [131].

4,639,337
PROCESS FOR SEPARATING SURFACTANTS FROM LIQUID USED IN THE MANUFACTURE OF CONCENTRATED FLUOROPOLYMER DISPERSIONS

Charles S. Cope, Parkersburg, W. Va.; Katsunosuke Kitagawa, and Kazuo Konabe, both of Shimizu, Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 14, 1985, Ser. No. 711,833

Int. Cl.[4] C11C *3/00*; C07B *53/21*

U.S. Cl. 260—408 1 Claim

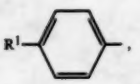
1. A process for separating a fluoroalkanoic acid having the general formula

$$X—R_f—COOH$$

wherein R_f is a saturated, perfluorinated linear or methyl-branched alkylene group containing from 5 to 10 carbon atoms and X is a member of the class consisting of hydrogen, fluorine or chlorine from a hydrocarbyl oxyethoxylated polyether having the general formula:

$$R(O—CH_2—CH_2)_yOH$$

where R is a primary of secondary alkyl group of from 11 to 18 carbon atoms or is



where R^1 is a primary, secondary, or tertiary alkyl group containing from 8 to 12 carbon atoms, and y is a number of from 8 to 14, when both are present in an organic liquid selected from dichloromethane or trichloromethane, which comprises:

(1) contacting said organic liquid with activated alumina and separating the organic liquid from the alumina,

(2) washing and drying the alumina and contacting it with ammonium hydroxide whereby the ammonium salt of the fluoroalkanoic acid is removed from the alumina,

(3) boiling the organic liquid obtained in step (1) until the ethoxylated compound remains.

4,639,338

PREPARATION OF CRYSTALLINE DISODIUM 3-AMINO-1-HYDROXYPROPANE-1,1-DIPHOSPHONATE PENTAHYDRATE

Peter H. Stahl, Freiburg i/Br., Fed. Rep. of Germany, and Beat Schmitz, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 759,985

Claims priority, application Switzerland, Aug. 6, 1984, 3768/84

Int. Cl.[4] C07F *9/38;* **A61K** *31/045, 31/66*

U.S. Cl. 260—502.5 C **11 Claims**

1. Process for the manufacture of disodium 3-amino-1-hydroxypropane-1,1-diphosphonate in a crystalline form that contains water of crystallisation, characterised in that disodium 3-amino-1-hydroxypropane-1,1-diphosphonate is caused to crystallise from a water-containing solution or that a solid form of disodium 3-amino-1-hydroxypropane-1,1-diphosphonate containing relatively little water is treated with water, and in each case the product is isolated and dried at normal or slightly elevated temperature.

4,639,339

SULFONATED POLYETHYLENEIMINE USEFUL AS BLOOD ANTICOAGULANT

Yoshio Murashige, Iwakuni; Akira Yanagase; Yasunori Kawachi, both of Ohtake, and Junko Soga, Saiki, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,145

Claims priority, application Japan, Aug. 13, 1985, 60-178069

Int. Cl.[4] C07C *143/86*

U.S. Cl. 260—513.6 **2 Claims**

1. A sulfonated polyethyleneimine formed by sulfonating 1 mole % or more of the —NH— and —NH_2 groups present in a polyethyleneimine having a molecular weight of 300 or greater.

4,639,340

DISSOLVING GAS IN A LIQUID

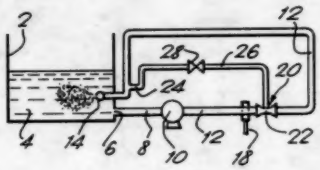
Michael E. Garrett, Woking, England, assignor to The BOC Group plc, Windlesham, England

Filed Jan. 23, 1985, Ser. No. 693,937

Claims priority, application United Kingdom, Jan. 24, 1984, 8401779

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—36.1 **21 Claims**



1. A method of dissolving gas in a liquid comprising the steps of pressurising a stream of liquid, introducing the gas into the stream to dissolve some of the gas therein and to form a gas-liquid mixture travelling at a velocity less than that of sound in said mixture, accelerating the stream to a supersonic velocity to create a first shockwave effective to reduce the size of the gas bubbles in the stream and thereby to form a dispersion of small gas bubbles in the liquid, reducing the velocity of the stream to below sonic velocity, transporting the stream as said dispersion of small gas bubbles in the liquid to at least one outlet in a volume of the liquid at a substantially lower pressure than that to which said stream is pressurized accelerating the stream at near to said outlet so as to create a second shockwave effective to reduce further the size of the gas bubbles, and introducing the stream through said outlet into the volume of liquid.

4,639,341

METHOD FOR INJECTION MOLDING ARTICLES WHILE SIMULTANEOUSLY FORMING PATTERNS THEREON

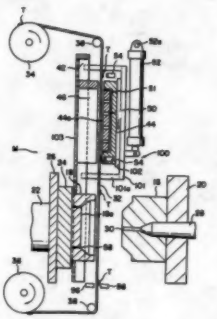
Keiji Hanamoto, Miyoshi, and Fumio Takagi, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 523,757, Aug. 16, 1983, Pat. No. 4,545,752. This application Jul. 3, 1985, Ser. No. 752,253

Claims priority, application Japan, Aug. 17, 1982, 57-142398; May 4, 1983, 58-78592

Int. Cl.[4] B29C *31/08, 45/14, 51/16*

U.S. Cl. 264—40.1 **3 Claims**



1. A method for molding an article by injection molding while simultaneously imprinting on or transferring onto the molded article a pattern on a continuous pattern sheet,

wherein, prior to the injection of molten plastic material, a softened pattern sheet is pre-molded by pressing said pattern sheet under an air pressure against the cavity surface of a female mold, and wherein the molten plastic material is injected from a male mold into the cavity defined between said male and female molds mated together with each other to integrate the molded article with the pattern on said pattern sheet, said method comprising the steps of:

(a) disposing said pattern sheet which has a plurality of patterns and register marks spaced apart from each other by a predetermined distance in its longitudinal direction in such a way that said pattern sheet is transported so as to cover the opening of said female mold;

(b) detecting the register marks on said pattern sheet at the upstream of said female mold to cause pattern-sheet-holding-and-transferring means to actuate in a manner to hold said pattern sheet at a predetermined position with respect to each pattern thereon;

(c) sucking the pattern sheet against heating means of the pattern-sheet-holding-and-transferring means through air passages formed therein at an initial position wherein the pattern-sheet-holding-and-transferring means is located at the upstream of the female mold;

(d) moving the pattern-sheet-holding-and-transferring means to the female mold from its inital position while its heating means holds and heats the pattern sheet to be softened in order to transport by one pitch said pattern sheet so as to cover said opening of said female mold while heating said pattern sheet;

(e) pressing the softened pattern sheet transfered over a cavity of the female mold against a cavity surface thereof by blowing compressing air through air passages, thereby premolding the pattern sheet;

(f) returning said pattern-sheet-holding-and-transferring means to its initial position; and

(g) injecting the molten plastic material through the male mold into the cavity defined by said male and female molds which are mated together, whereby the molded article is integrated with said pattern sheet.

4,639,342

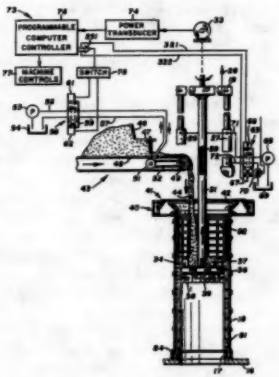
COMBINED CONCRETE FEED AND PACKERHEAD LIFT CONTROL

Tarek A. Adly, Nashua, Iowa, assignor to Hydrotile Machinery Company, Nashua, Iowa

Continuation-in-part of Ser. No. 619,748, Jun. 11, 1984, abandoned. This application Jan. 27, 1986, Ser. No. 823,160

Int. Cl.[4] **B28B** *7/18, 13/02, 21/10*

U.S. Cl. 264—40.1 **15 Claims**



5. In a packerhead pipe making machine having a packerhead which is simultaneously rotated by a packerhead motor and lifted by variable speed lift means to form a concrete pipe within a vertically oriented mold from concrete that is deposited into the mold on top of the packerhead by a conveyor driven by a variable speed conveyor motor, a control for coordinating the regulation of the speed of the conveyor and the lift speed of the packerhead to maintain the density of the pipe substantially uniformly between predetermined limits of overpacking and underpacking, comprising:

(a) first means for sensing the power used to rotate the packerhead and for generating a packerhead motor load signal representative of the sensed power;

(b) second means responsive to said packerhead motor load signal to control the speed of the conveyor motor and thereby to control the rate at which concrete is discharged by the conveyor into the mold; and

(c) third means for maintaining the lift speed of the packerhead substantially constant during variations of said packerhead motor load signal between a selected upper limit packerhead motor load signal and a selected lower limit packerhead motor load signal; and

(d) said third means further providing for increasing the lift speed of the packerhead up to a selected maximum lift speed in response to an increase of said packerhead motor load signal above said upper limit signal and for decreasing the lift speed of the packerhead down to a selected minimum lift speed in response to a decrease of said packerhead motor load signal below said lower limit signal.

12. A method for making concrete pipe with a machine having a packerhead for forming concrete pipe in a vertically oriented mold, packerhead motor means for rotating the packerhead, lift means for moving the packerhead in an upward direction through the mold, and conveyor means driven by a conveyor motor for supplying concrete to the mold, said method comprising the steps of:

locating the packerhead in the lower end of the mold;

discharging concrete from the conveyor means into the mold while simultaneously rotating and lifting the packerhead relative to the mold to form a concrete pipe therein;

sensing the power used by the packerhead motor means to rotate the packerhead and providing a packerhead motor load signal representative of the power used;

controlling the amount of concrete discharged into the mold by varying the operating speed of the conveyor motor as a function of the packerhead motor load signal;

providing a packerhead motor load upper limit reference signal and a packerhead motor load lower limit reference signal; and

varying the lift speed of the packerhead within a range between a selected maximum lift speed and a selected minimum lift speed when the packerhead motor load exceeds the upper limit reference signal or falls below the lower limit reference signal whereby the density of the concrete pipe formed within the mold is substantially uniform throughout its length.

4,639,343

FORMING TECHNIQUES FOR SHAPING POLYIMIDE FOAMS

John V. Long, 1756 E. Lexington Pl., El Cajon, Calif. 92021, and John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120

Filed May 20, 1985, Ser. No. 736,241

Int. Cl.[4] **C08J** *9/34, 9/02;* **B29C** *43/00, 67/22*

U.S. Cl. 264—45.5 **15 Claims**

1. The method of reshaping polyimide foam sheets which comprises the steps of:

providing a sheet of polyimide foam;

placing one major surface of said sheet into contact with a first mold surface;

bringing a second mold surface at least into substantially complete contact with the second major surface of said sheet and compressing and reshaping the sheet;

heating at least one major surface of said sheet to a temperature of from about 220° to 320° C. for about 0.5 to 5 minutes while allowing the balance of said sheet to remain at a lower temperature; and

removing the reshaped foam sheet from the mold;

whereby a self-sustaining foam structure having a higher density, moisture impervious, fire blocking and abrasion resistant skin on the heated foam surface results.

4,639,344

PROCESS FOR PRODUCING FORMED ARTICLES OF AROMATIC POLYAMIDE-IMIDE RESIN

Katsuji Ueno; Kenji Nagaoka, both of Hirakata; Akira Miyashita, and Satoshi Ebisu, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

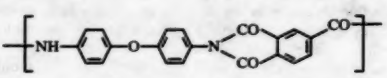
Filed Jun. 6, 1984, Ser. No. 617,632

Claims priority, application Japan, Jun. 16, 1983, 58-109028

Int. Cl.⁴ B29B *13/02*; B29C *43/00*; C08J *3/00*

U.S. Cl. 264—83 **3 Claims**

1. In a process for producing a formed articles of aromatic polyamide-imide resin by compression-molding at a temperature lower than the melting temperature of the resin, said aromatic polyamide-imide resin comprising a substantially single recurring unit represented by the formula



the improvement which comprises subjecting the resin, prior to molding, to heat treatment in an oxygen-containing gas under conditions satisfying the following equation

$$\log t \geqq a_1 + a_2 T + a_3 T^2 + a_4 T^3,$$

wherein $a_1 = 2.5841$, $a_2 = -8.4926 \times 10^{-3}$, $a_3 = 6.9984 \times 10^{-6}$, and $a_N = -2.0449 \times 10^{-8}$; t represents the lower limit for the heat-treatment time in hours and T represents the heat-treatment temperature in °C.; and 200° C. $\leqq$ T $\leqq$ 400° C.

4,639,345

INTERLOCKING BUILDING BLOCK SYSTEM

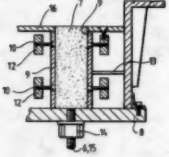
Randolffa R. Olsen, P.O. Box 4615, Harare, Zimbabwe, South Africa

Filed Mar. 24, 1983, Ser. No. 478,554

Claims priority, application United Kingdom, Mar. 24, 1982, 82/08626

Int. Cl.⁴ B29C *33/40*; B28B *7/36*

U.S. Cl. 264—226 **14 Claims**



1. A method of manufacturing a machine mould for the continuous casting in cycles of a plurality of dry wall building blocks of substantially constant cross-section, the method comprising:

(i) providing at least one master form of a shape and dimensions corresponding to the shape and dimensions of the required finished block;

(ii) positioning a plurality of metal liners against side faces of the or each master form, each liner defining a wear surface and being positioned with the wear surface laid face-to-face on a respective side face of the master form so as to form a mould cavity or cavities reproducing at least in part the shape of the master form or forms;

(iii) filling the spaces around the or each master form and liners to a required height with a liquid casting compound which is then allowed to set; and

(iv) removing the or each master form to leave a female mould having a mould cavity or cavities corresponding in shape to the shape of the master form or forms.

4,639,346

METHOD AND APPARATUS FOR CALENDERING MAGNETIC TAPES

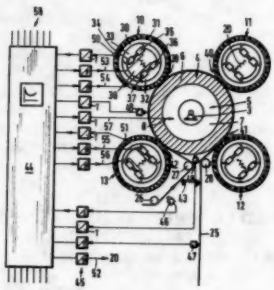
Josef Pav; Richard Rauf, both of Krefeld; Peter Svenka, Grefrath, and Reinhard Wenzel, Krefeld, all of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,068

Claims priority, application Fed. Rep. of Germany, May 2, 1984, 3416211

Int. Cl.⁴ B29B *13/02*; B29C *43/24, 43/46*

U.S. Cl. 264—280 **27 Claims**



1. A method of calendering a web of the type having a magnetic film at one side thereof, particularly of calendering an audio or video recording tape, comprising the steps of advancing the web longitudinally in a predetermined direction and along an elongated path; training the web over at least one primary calendering roll in a predetermined portion of the path so that the magnetic film of successive elongated increments of the running web contacts the primary roll; establishing at least two-spaced-apart nips between the primary roll and discrete secondary rolls so that spaced-apart portions of said increments are compelled to advance through and are compressed in such nips, the upstream nip of said nips constituting the foremost compressing nip along said path; heating the primary roll so that the latter exchanges heat with successive increments of the running web including those portions of the increments which extend between the nips; and heating the web ahead of said upstream nip, the training step including maintaining the web in substantially uninterrupted contact with the primary roll in the portion of said path between said nips.

9. A calender for a web of the type having a magnetic film at one side thereof, particularly for calendering an audio or video recording tape, comprising a frame; a primary calendering roll mounted in said frame for rotation about a fixed axis; at least two secondary calender rolls rotatably supported by said frame and defining with said primary roll spaced-apart compressing nips; means for advancing the web in a predetermined direction and along an elongated path which extends along the

periphery of said primary roll and through said nips, the upstream nip of said nips constituting the foremost compressing nip along said path, and said advancing means being arranged to advance the web in such a way that the running web contacts the primary roll ahead of said upstream nip and is maintained in substantially uninterrupted contact with said primary roll in the portion of said path between said nips; means for moving at least one of said secondary rolls with reference to said primary roll so as to alter the pressure upon the running web in the respective nip; and means for heating said primary roll so that the latter exchanges heat with the running web in the entire portion of said path between said nips.

4,639,347

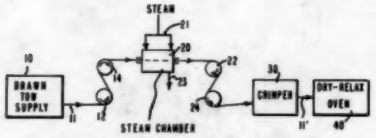
PROCESS OF MAKING CRIMPED, ANNEALED POLYESTER FILAMENTS

Jack A. Hancock, Franklin, Tenn.; Walter D. Johnson, Midlothian, Va., and Alan D. Kennedy, Kinston, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 491,267, May 4, 1983, abandoned. This application Mar. 16, 1984, Ser. No. 590,291

Int. Cl.⁴ B29C *55/00*

U.S. Cl. 264—291 **5 Claims**



1. A process for manufacturing crimped, annealed filaments consisting essentially of poly(ethylene terephthalate) comprising advancing a bundle of substantially fully drawn filaments through a pressurized zone of saturated steam maintained at a pressure of at least about 150 psig for at least about 0.2 seconds while controlling the bundle length within the zone within the range of from about 5% extension to no more than about 10% retraction, withdrawing the bundle from the zone into ambient atmospheric pressure whereupon the filaments are rapidly cooled by vaporization of water while they are still under said controlled length, crimping the cooled filaments and drying and relaxing the crimped filaments at a temperature of less than about 125° C.

4,639,348

RECYCLOTRON III, A RECIRCULATING PLASMA FUSION SYSTEM

William S. Jarnagin, P.O. Box 127, Concord, Mass. 01742

Filed Nov. 13, 1984, Ser. No. 670,806

Int. Cl.⁴ G21B *1/02*; G21D *7/00*; H05H *1/14, 1/24*

U.S. Cl. 376—107 **5 Claims**

1. A recyclotron nuclear fusion system comprising a plurality of recyclotrons, each said recyclotron comprising cyclotron means for receiving and accelerating charged particles in spiral and work conservative pathways, and output means for forming a beam from particles received from said cyclotron means;

(i) said cyclotron means comprising

(a) a channel shaped electromagnet having a pair of indented polefaces, oriented along an input axis and defining an input magnetic well,

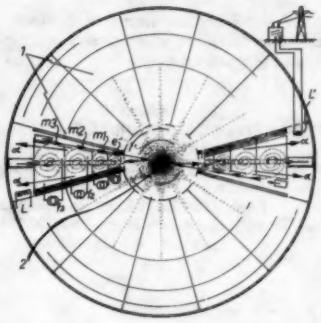
(b) a pair of elongated linear electrodes centered along said input magnetic well arranged generally parallel to said input axis and having a gap therebetween,

(c) tuned oscillator means connected to said electrodes for applying an oscillating electric potential thereto,

(ii) said output means comprising

(e) inverter means comprising an electromagnet having a polarity opposite that of the channel shaped electromagnet oriented contigously therealong for extracting fully accelerated particles from said cyclotron means,

(f) reinverter means comprising an electromagnet having a polarity the same as that of the channel shaped electromagnet for correcting the flightpath of the extracted particles, said inverter means and said reinverter means defining an output axis, said output means directing said beam along said output axis;



each of said plurality of recyclotrons being arranged so that particles of its output beam are received by the input magnetic well of an opposing similar recyclotron.

5. A recyclotron nuclear fusion system as in claim **1**, wherein said plurality of recyclotrons are arranged in a generally spherical array, each recyclotron being radially tapered and having its output beam directed toward the center of the generally spherical array.

4,639,349

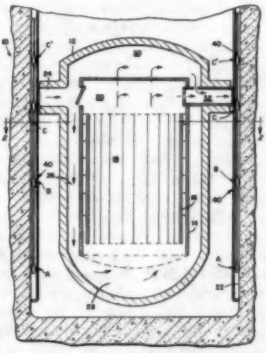
NON-INVASIVE LIQUID LEVEL AND DENSITY GAUGE FOR NUCLEAR POWER REACTOR PRESSURE VESSELS

Anthony J. Baratta, Tyrone; William A. Jester, State College; Edward S. Kenney, State College; Ira B. McMaster, State College, all of Pa., and Mortimer A. Schultz, N. Palm Beach, Fla., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 360,194, Mar. 22, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,659

Int. Cl.⁴ G21C *17/00*

U.S. Cl. 376—254 **10 Claims**



4. A method of non-invasively determining the liquid coolant level and density in a nuclear power reactor pressure vessel comprising the steps:

positioning at least three neutron detector fission chambers

externally of the reactor pressure vessel at multiple spaced positions along the side of the fuel core, with one of the neutron detectors being positioned at the side near the bottom of the fuel core, with the multiple spaced positions along the side removing any ambiguity as to whether the liquid level is decreasing or increasing:

shielding the neutron detector fission chamber from thermal neutrons to avoid the noise associated therewith, and

eliminating the effects of gamma radiation from the detected signals;

monitoring the detected neutron level signals to determine the coolant liquid level and density in the nuclear power reactor pressure vessel.

4,639,350

COVER-PLUG FOR THE CORE OF A FAST NEUTRON NUCLEAR REACTOR

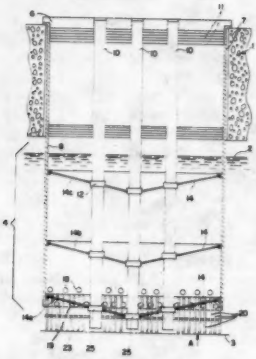
Claude Malaval, Antony, France, assignor to Novatome, Plessis-Robinson, France

Filed Oct. 13, 1983, Ser. No. 541,745

Claims priority, application France, Nov. 5, 1982, 82-18570

Int. Cl.⁴ G21C *13/06*

U.S. Cl. 376—290 **6 Claims**



1. A fast neutron nuclear reactor comprising a reactor vessel, a core, control rods, a cooling fluid contained in said reactor vessel, core instrumentation and a cover plug comprising a support plate resting on a turning plug (1) closing said reactor vessel, around an opening for passage (7) of said core cover-plug (4) into said turning plug (1), a cylindrical shell (8) having a vertical axis and fixed integrally to said support plate (6) at its upper part, a plug for radiation protection (11) occupying the internal volume of said cylindrical shell over a height which corresponds substantially to the thickness of said turning plug, and a set of vertical tubes (10) for receiving said control rods, said vertical tubes being fixed to said support plate (6) at their upper ends, arranged within said cylindrical shell (8) and connected to braces (14) having outer edges and arranged transversely relative to said shell (8), wherein

(a) a set of said braces (14) which are fixed to said tubes (10), inside said shell (8) consists of at least two vertically spaced conical webs (14) having an axis coinciding with the axis of said shell (8), a top angle greater than 120° and an external diameter which is slightly smaller than the internal diameter of said shell (8), a clearance existing between the inner surface of said shell (8) and said outer edge of said braces (14);

(b) said braces (14) are held in an axial position relative to said cylindrical shell (8) by abutments (15) which are integral with said shell (8) each of said braces having openings only large enough to allow passage of said vertical tubes therethrough, the upper of said at least two braces having additional passages allowing passage of sodium therethrough; and

(c) the lowermost brace (14*a*) is free of any additional sodium passage holes and is arranged with its outer surface directed downwardly, said lowermost brace being held by said abutments just above the lower part of said shell (8) said shell being pierced with openings (18, 19) only in the lower portion thereof, said openings (18, 19) being on either side of said lowermost brace (14*a*) enabling deflection of said cooling fluid.

4,639,351

REPAIR DEVICE FOR A REACTOR PRESSURE VESSEL

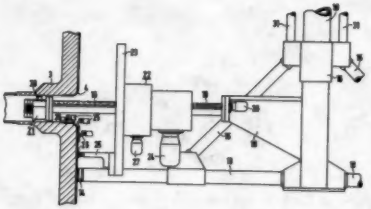
Siegfried Förner, Erlangen; Erich Kätscher, Marloffstein, and Stefan Ring, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 590,691

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310947

Int. Cl.⁴ G21C *19/42*

U.S. Cl. 376—310 **4 Claims**



1. Repair device for removing an inner surface layer on a feed-water connector of a reactor pressure vessel received in a reactor housing having an assembly platform with a carriage displaceable thereon transversely to the reactor pressure vessel, the repair device comprising centering means located at a lower end of a telescopically extensible upright tube suspended from the carriage for centering said lower end of said upright tube in the pressure vessel, said centering means having at least two outwardly swingable supports and a hydraulic system for swinging said two supports outwardly umbrella-like; a supporting frame for a feed-rod also disposed at said lower end of said upright tube, said feed-rod being horizontally self-supporting at an end thereof; a drive motor connected to said feed rod for rotating said feed-rod; means located at said self-supporting end of said feed rod for centrally fixing said self-supporting end in the feed-water connector of the reactor pressure vessel, and a horizontally displaceable turning machine tool mounted on said feed rod, said turning machine tool having a face plate and a radially movable holder for a turning tool bit carried by said mounting support.

4,639,352

HARD ALLOY CONTAINING MOLYBDENUM

Mitsuo Kodama; Masaya Miyake; Minoi Nakano; Tsuyoshi Asai, and Akio Hara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 738,908, May 29, 1985, abandoned, which is a continuation of Ser. No. 548,034, Nov. 2, 1983, abandoned, which is a continuation of Ser. No. 269,664, Jun. 2, 1981, abandoned. This application Dec. 13, 1985, Ser. No. 808,228

Int. Cl.⁴ C22C *29/02*

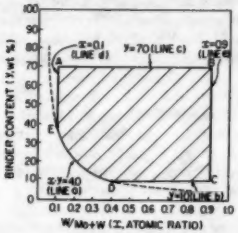
U.S. Cl. 419—15 **12 Claims**

1. A process for preparing a hard alloy having a gross composition within the range of the shaded portion ABCDEA in FIG. 1, comprising the following two phases:

(1) a hard phase comprising at least one compound having a simple hexagonal MC type crystal structure selected from the group consisting of mixed carbides, carbonitrides and carboxynitrides of molybdenum and tungsten, and

(2) a binder phase comprising at least one element selected from the group consisting of iron, cobalt, and nickel,

which process comprises reducing a mixture of oxides of molydenum and tungsten having a particle size of at most 1 micron to produce an (Mo,W) alloy; heat treating said (Mo,W) alloy at a temperature of 1100° to 1400° C. in a



stream of nitrogen or hydrogen; carburizing the heat-treated alloy at a controlled temperature which is as high as possible but lower than the decomposition temperature of (Mo,W)C into $(Mo,W)_2C$, to produce said hard phase composed of coarse particles having a mean particle size of at least 3 microns and having a uniform molybdenum to tungsten ratio in said coarse particles; mixing said hard phase with said binder phase; and sintering the resultant mixture to produce said hard alloy, said process being conducted in a manner to hold the quantity of M_2C precipitated to a minimum.

4,639,353

BLOOD OXYGENATOR USING A HOLLOW-FIBER MEMBRANE

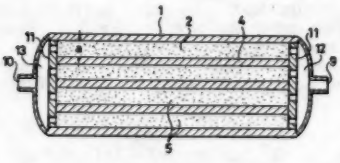
Tohru Takemura; Atushi Nakashima, both of Ohtake; Haruhiko Yoshida, Kuga; Jun Kamo, and Elichi Hamada, both of Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,391

Claims priority, application Japan, Apr. 24, 1984, 59-81088; Aug. 7, 1984, 59-164280; Nov. 9, 1984, 59-236027; Nov. 9, 1984, 59-236028

Int. Cl.⁴ A61M *1/14*; B01D *13/01*

U.S. Cl. 422—46 **10 Claims**



1. A blood oxygenator comprising:

a housing having a plurality of contact chambers therein, a blood inlet, a blood outlet, a gas inlet, and a gas outlet, said plurality of chambers communicating respectively with said blood inlet and said blood outlet and forming separate blood flow paths between said blood inlet and said blood outlet, said oxygenator comprising means downstream from said blood inlet for separating blood into separate but substantially equal volumes of blood and for introducing said separate but substantially equal volumes, respectively, into said plurality of chambers; and

a bundle or bundles of hollow fibers of a composition suitable for blood-gas oxygen exchange and being disposed in each said chamber substantially perpendicular to the direction of blood flow therethrough, opposite ends of said hollow; fibers respectively communicating with said gas inlet and said gas outlet.

4,639,354

APPARATUS FOR THE LIQUID PHASE HYDROTREATMENT OF HYDROCARBONS IN THE PRESENCE OF AN EXPANDED OR EBULLATED CATALYST BED

Didier Bischoff; Gérard Courteheuse, both of Rueil Malmaison, and Pierre Renard, Saint Nom La Breteche, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

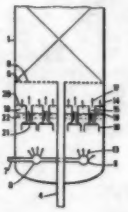
Division of Ser. No. 512,050, Jul. 8, 1983, Pat. No. 4,478,707. This application Aug. 16, 1984, Ser. No. 641,527

Claims priority, application France, Jul. 9, 1982, 82 12239

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.⁴ B01J *8/22*

U.S. Cl. 422—140 **11 Claims**



1. An apparatus for the catalytic treatment of a fluid charge, wherein solid particles are withdrawn and a fluid charge is introduced at the lower portion of a contact zone, comprising a reactor (1), a first introducing means for introducing fresh catalyst at an upper part of the reactor, a first discharge means for discharging used catalyst at a lower part of the reactor, wherein said first discharge means comprises at least one withdrawing tube (4) of sufficient size for discharging used catalyst from the reactor, said reactor further comprising:

(a) at least one wall (5), said wall being substantially horizontal and located at the lower part of the reactor, said wall being provided with perforations (6) substantially distributed over the major part of the surface of said wall, the size of said perforations being sufficiently small to prevent passage of catalyst particles introduced into the reactor through said perforations in said wall, but sufficiently large to permit passage through said wall of an ascending stream of a fluid charge;

(b) a second introducing means (7) and (8) for introducing a fluid at the lower part of the reactor and a second discharge means for discharging a treated fluid charge at the upper part of the reactor; and

(c) plural elements arranged between the discharge tube (4) and the second introducing means (7) and (8), said plural elements comprising:

(i) a grid means (14) having perforations (20) which are sufficiently small to prevent the passage of the major part of a liquid phase of fluid introduced through said second introducing means, and permitting only passage of the major part of a gaseous phase of the fluid introduced;

(ii) at least one continuous barrier means (15) supported on said grid means (14) and having a lower end arranged in the reactor at a level higher than that of said second

introducing means (7) and (8), said barrier means thus defining compartments (18) and chimneys (19); and

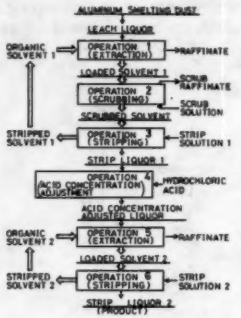
(iii) baffle means (21) arranged below the lower ends of said chimneys for ensuring accumulation of the introduced fluid in said compartments.

4,639,355

PROCESS FOR RECOVERING GALLIUM FROM ALUMINUM SMELTING DUST

Shingo Matsui; Hidetsugu Ikeda; Akio Era, all of Fukuoka, and Sanji Nishimura, Kyoto, all of Japan, assignors to Mitsui Aluminium Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,591
Int. Cl.[4] C01G *15/00*
U.S. Cl. 423—112 9 Claims



1. A process for recovering gallium from aluminum smelting dust comprising

(a) leaching aluminum smelting dust with sulfuric acid to obtain a leach liquor;

(b) extracting the leach liquor with a first organic solution containing an extracting agent comprising a liquid cation exchange agent selected from the group consisting of organic phosphoric acid, organic phosphoric acid and organic phosphoric acid having 8 to 20 carbon atoms per molecule to extract gallium and impurities from the leach liquor and to produce a first loaded organic solution;

(c) scrubbing the first loaded organic solution with an aqueous solution of 4–9 mol/l hydrochloric acid to scrub off the impurities;

(d) stripping the scrubbed loaded organic solution with a mineral acid selected from the group consisting of hydrochloric acid, sulfuric acid and nitric acid having a concentration higher than 0.1 mol/l to quantitatively strip gallium and to produce a stripped liquor;

(e) adjusting the acid concentration of the stripped liquor with hydrochloric acid to more than about 3 mol/l in concentration;

(f) extracting the concentration-adjusted stripped liquor with a second organic solution containing a neutral extracting agent selected from the group consisting of isopropyl ether, tributyl phosphate, methyl isobutyl ketone and trioctyl phosphine oxide to extract gallium and iron from the stripped liquor and to produce a second loaded organic solution; and

(g) stripping the second loaded organic solution with water or a dilute solution of mineral acid selected from the group consisting of hydrochloric acid, sulfuric acid and hydrochloric acid to strip gallium from the solution.

4,639,356

HIGH TECHNOLOGY CERAMICS WITH PARTIALLY STABILIZED ZIRCONIA

Michael P. O'Toole, and Roger J. Card, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 5, 1985, Ser. No. 795,288
Int. Cl.[4] C01G *25/02*
U.S. Cl. 423—266 25 Claims

1. A process for making a fully or a partially stabilized zirconia comprising:

(a) making an aqueous solution of zirconium sulfate in admixture with an inorganic or organic water soluble salt of one or more metals selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ac, Ce, Th, and Al, said organic salt having from about 1 to about 20 carbon atoms;

(b) atomizing said solution into a solvent at least partially miscible with water, said solvent present in an amount of at least 3 times the volume of said solution wherein the ratio of said solvent to said solution is about 3:1 to about 50:1, based on volume, said solvent being agitated during the addition of said solution, forming a coprecipitated metal salt;

(c) separating the coprecipitated metal salt from said solvent by filtration;

(d) washing the coprecipitated metal salt filtrate with an inert solvent or solvents;

(e) drying the washed filtrate; and

(f) calcining the dried filtrate in a flowing gas or mixture of gases.

4,639,357

CRYSTALLINE SILICOPHOSPHOALUMINATE MCM-5

Eric G. Derouane, Namur, Belgium, and Roland von Ballmoos, Pennington, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 562,908, Dec. 19, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 685,172
Int. Cl.[4] C01B *25/36, 33/28*
U.S. Cl. 423—306 18 Claims

1. A synthetic crystalline material having a composition as follows:

$$vA:M_{x/m}{}^{m+}:(AlO_2)_{1-y}{}^{-}:(PO_2)_{1-x}{}^{+}:(SiO_2)_{x+y}\cdot N_{y/n}{}^{n-}wH_2O$$

wherein M is a cation of valence m, N is an anion of valence n, A is occluded organic directing agent and solvent, v is the number of moles of A, w is the number of of moles of H_2O and x and y are numbers of from greater than -1 to less than $+1$ which satisfy the relationships:

(1) if x is 0, then y is not 0,

(2) if y is 0, then x is not 0,

(3) if the atomic ratio of Al/P is greater than 1, then $x+y$ is greater than 0.001 and $y+0.6x$ is less than 0.4, and

(4) if the atomic ratio of Al/P is less than 1, then $x+y$ is greater than 0.001 and $x+0.5y$ is less than 0.5,

which, as synthesized, exhibits a characteristic X-ray diffraction pattern as shown in Table 1-A of the specification.

4,639,358

CRYSTALLINE SILICOPHOSPHOALUMINATE MCM-1

Eric G. Derouane, Namur, Belgium, and Roland von Ballmoos, Pennington, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 562,677, Dec. 19, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 685,173
Int. Cl.[4] C01B *25/36, 33/28*
U.S. Cl. 423—306 18 Claims

1. A synthetic crystalline material having a composition as follows:

$$vA:M^{m+}{}_{x/m}:(AlO_2)^{-}{}_{1-y}(PO_2)^{+}{}_{1-x}:(SiO_2)_x \cdot +_yN^{n-}{}_{y/n}wH_2O$$

wherein M is a cation of valence m, N is an anion of valence n, A is occluded organic directing agent and solvent, v is the number of moles of A, w is the number of moles of H_2O and x and y are numbers of from greater than -1 to less than $+1$ which satisfy the relationships:

(1) if x is 0, then y is not 0,
(2) if y is 0, then x is not 0,
(3) if the atomic ratio of Al/P is greater than 1, then $x+y$ is greater than 0.001 and $y+0.6x$ is less than 0.4, and
(4) if the atomic ratio of Al/P is less than 1, then $x+y$ is greater than 0.001 and $x+0.5y$ is less than 0.5,

which, as synthesized, exhibits a characteristic X-ray diffraction pattern as shown in Table 1-A of the specification.

4,639,359

PROCESS OF REMOVING CATIONIC IMPURITIES FROM WET PROCESS PHOSPHORIC ACID

Dennis H. Michalski, Lakeland, Fla., and Viswanathan Srinivasan, Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 16, 1985, Ser. No. 809,440
Int. Cl.[4] C01B *25/16*
U.S. Cl. 423—321 R **20 Claims**

1. A method for removing aluminum, magnesium and iron impurities from wet process phosphoric acid having a P_2O_5 content of about 17-54%, comprising the steps of:

partially ammoniating the phosphoric acid;

adding a fluoride ion donating compound to the acid to form a precipitate;

separating the precipitate from the acid; and

recovering a partially ammoniated wet process phosphoric acid of reduced impurity content.

4,639,360

SYNTHESIS OF CRYSTALLINE SILICATE ZSM-5 USING AN ORGANIC SULFONIC ACID

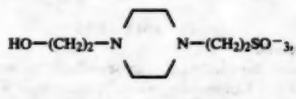
Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 28, 1985, Ser. No. 791,658
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—329 **24 Claims**

1. A method for synthesizing a crystalline silicate having the structure of ZSM-5 exhibiting a characteristic X-ray diffraction pattern as shown in Table 1 of the specification, which comprises (i) preparing a mixture capable of forming said silicate, said mixture comprising sources of alkali metal cations (M), an oxide of silicon, an oxide of aluminum, water and an anionic directing agent (R), and having a composition, in terms of mole ratios, within the following ranges:

SiO_2/Al_2O_3	20 to less than 400
H_2O/SiO_2	2 to 1000
OH^-/SiO_2	0 to 10
M/SiO_2	0.01 to 4
R/SiO_2	0.01 to 4

wherein R is an anion of the formula



(ii) maintaining said mixture under sufficient conditions until crystals of said silicate are formed and (iii) recovering said crystalline silicate having the structure of ZSM-5 from step (ii), said recovered crystalline silicate containing said anion R and alkali metal cations.

4,639,361

PROCESS OF PREPARING DISILANE BY REDUCTION OF HEXACHLORODISILANE

Koji Aono, Saitama; Toshinori Saito, Kawagoe, and Chiharu Okada, Kamifukuoka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Feb. 19, 1985, Ser. No. 702,643
Claims priority, application Japan, Feb. 21, 1984, 59-29507
Int. Cl.[4] C01B *33/04*
U.S. Cl. 423—347 **12 Claims**

1. A process of preparing disilane, comprising the step of subjecting hexachlorodisilane to a reduction reaction with a mixture of lithium hydride and lithium aluminum hydride in an organic liquid medium; wherein the molar ratio of lithium hydride to lithium aluminum hydride in said mixture is between about 2 and about 20 and wherein the total quantity of lithium hydride and lithium aluminum hydride is between about 110 percent and about 150 percent of the theoretical quantity.

4,639,362

PROCESS FOR THE PRODUCTION OF MAGALDRATE

Klaus Schanz, Dannstadt-Schauernheim, Fed. Rep. of Germany, assignor to Giulini Chemie GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,553
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408463
Int. Cl.[4] C01F *1/00*; A61K *33/08, 33/04*
U.S. Cl. 423—554 **5 Claims**

1. A process for producing magaldrate of the formula,

$$Al_5Mg_{10}(OH)_{31}(SO_4)_2 \cdot \times H_2O,$$

comprising mixing an aqueous suspension of carbonate containing active aluminum hydroxide with an aluminum sulfate solution in stoichiometric quantities under intensive stirring; after the generation of carbon dioxide ceases, mixing in stoichiometric quantities of magnesium oxide having an iodine number between 20 and 100; and allowing the resulting mixture to stand for 10 to 24 hours without mixing to form magaldrate paste.

4. A process for producing magaldrate of the formula,

$$Al_5Mg_{10}(OH)_{31}(SO_4)_2 \cdot \times H_2O,$$

comprising combining magnesium hydroxide with at least one water soluble sulfate containing compound in the presence of water and in stoichiometric quantities while stirring, thereafter adding stoichiometric quantities of active aluminum hydroxide while continuing to stir, and allowing the resulting mixture to stand without mixing to form magaldrate paste.

4,639,363

PROCESS FOR PREPARING AMORPHOUS PHASES OF INTERMETALLIC COMPOUNDS BY A CHEMICAL REACTION

Masao Komatsu, Higashi-Osaka, and Hiroshi Fujita, Ibaraki, both of Japan, assignors to Osaka University, Suita, Japan

Filed Mar. 12, 1985, Ser. No. 711,442
Claims priority, application Japan, Sep. 14, 1984, 59-191643
Int. Cl.[4] C01B *6/24*
U.S. Cl. 423—644 **8 Claims**

1. A process for preparing amorphous hydrides of intermetallic compounds by a chemical reaction, said process comprising:

a. alloying a mixture consisting essentially of zirconium and aluminum to form intermetallic compounds thereof; and

b. reacting said intermetallic compounds at an elevated temperature in a reaction chamber with a gas including hydrogen gas to produce amorphous hydrides of said intermetallic compounds, said elevated temperature ranging from a temperature effective to cause said chemical

reaction to a temperature which does not equal or exceed the temperature at which said amorphous hydrides crystallize.

8. Amorphous hydrides of intermetallic compounds prepared by a process comprising:

a. alloying a mixture consisting essentially of zirconium and aluminum to form intermetallic compounds thereof; and

b. reacting said intermetallic compounds at an elevated temperature in a reaction chamber with a gas including hydrogen gas to produce amorphous hydrides of said intermetallic compounds, said elevated temperature ranging from a temperature effective to cause a chemical reaction to a temperature which does not equal or exceed the temperature at which said amorphous phases crystallize.

4,639,364

METHODS AND COMPOSITIONS FOR ENHANCING MAGNETIC RESONANCE IMAGING

George B. Hoey, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Nov. 14, 1984, Ser. No. 671,456
Int. Cl.[4] A61K *49/00*; A61B *5/05, 6/00*
U.S. Cl. 424—9 9 Claims

1. A method for obtaining fluorine magnetic resonance images of body organs and tissues which comprises administering to a mammal a composition comprising a water soluble, substantially nontoxic salt of a compound of the formula:

CF_3R

wherein R is $—SO_3H$, $—SO_2NH_2$ or $—PO_3H_2$, in a sufficient amount to provide fluorine magnetic resonance images of said body organs and tissues, and imaging said organs and tissues.

4,639,365

GADOLINIUM CHELATES AS NMR CONTRAST AGENTS

A. Dean Sherry, Richardson, Tex., assignor to The Board of Regents, The University of Texas System, Austin, Tex.

Filed Oct. 18, 1984, Ser. No. 662,075
Int. Cl.[4] A61K *49/00*; G01N *31/00*; A61B *6/00*
U.S. Cl. 424—9 4 Claims

1. A method of enhancing NMR contrast in a living subject, comprising administering internally to the subject an effective amount of a contrast agent which comprises a chelate of gadolinium with a compound selected from the group consisting of DOTRA, DOTA, NOTA, and salts thereof.

4,639,366

POLYMERS CONTAINING PENDANT ACID FUNCTIONALITIES AND LABILE BACKBONE BONDS

Jorge Heller, Woodside, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 6, 1984, Ser. No. 618,002
Int. Cl.[4] A61K *31/74, 31/765*
U.S. Cl. 424—19 4 Claims

1. A polymer with at least one labile backbone bond per repeat unit and at least one pendant acid functionality per thousand repeat units.

4,639,367

AEROSOL FOAM

Leonard Mackles, New York, N.Y., assignor to Product Resources International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 713,294, Mar. 18, 1985, abandoned. This application Sep. 20, 1985, Ser. No. 778,026
Int. Cl.[4] A61K *9/00*
U.S. Cl. 424—45 23 Claims

1. An edible, anhydrous aerosol foam composition comprising a foamable liquid oil, a foaming agent and a propellant, said propellant being present in an amount sufficient to produce a stable, measurable foam but insufficient to produce a spray when said composition is ejected through an aerosol valve, and dispersed solid particles, said particles comprising an active therapeutic agent.

4,639,368

CHEWING GUM CONTAINING A MEDICAMENT AND TASTE MASKERS

Sarfaraz Niazi, Oakbrook, Ill., and Alvin Shemesh, Hopkins, Minn., assignors to Farmacon Research Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 643,584, Aug. 23, 1984. This application Jun. 6, 1985, Ser. No. 741,871
Int. Cl.[4] A61K *9/68*
U.S. Cl. 424—48 11 Claims

1. A chewing gum composition adapted to supply a medicament to the oral cavity comprising, a chewing gum base, an orally administrable medicament capable of being absorbed through the buccal cavity, said medicament consisting essentially of phenylpropanol amine, and a carbon dioxide generator.

4,639,369

HIGHER ACYL LOWER ALKYL HYDROXYSTEARATES USEFUL IN COSMETICS

Joseph P. Claudelli, Ramsey, N.J., assignor to Revlon, Inc., New York, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,687
The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.
Int. Cl.[4] C11C *3/00*; A61K *7/027, 7/42, 7/15*
U.S. Cl. 424—59 10 Claims

1. A fatty acid ester of the formula

$$CH_3(CH_2)_5CH(OCOR_1)(CH_2)_{10}COOR_2$$

wherein,

R_1 is a hydrocarbon radical having 17 carbon atoms with 1 to 3 double bonds therein; and

R_2 is a hydrocarbon radical having 1 to 4 carbon atoms.

10. A cosmetic composition comprising by weight 1–20% of a fatty acid ester of the formula

$$CH_3(CH_2)_5CH(OCOR_1)(CH_2)_{10}COOR_2$$

wherein,

R_1 is a hydrocarbon radical having 17 carbon atoms with 1 to 3 double bonds therein; and

R_2 is a hydrocarbon radical having 1 to 4 carbon atoms;

5–10% of an humectant;

0.2–1.0% of a thickener

0.5–10% of an emulsifier; and

50–80% water.

4,639,370

PHARMACEUTICAL COMPOSITION

Fabio Carli, Turin, Italy, assignor to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Feb. 6, 1985, Ser. No. 698,815
Claims priority, application United Kingdom, Feb. 8, 1984, 8403359
Int. Cl.[4] A61K *31/79*
U.S. Cl. 424—80 7 Claims

1. A process for loading a water-swellable, water-insoluble polymer with a biologically active substance or a substance convertible into a biologically active substance in vivo, which process comprises:

preparing and grinding a mixture of a said substance with a water-swellable, water-insoluble polymer in a weight ratio of the said substance:polymer of from 1:0.1 to 1:100.

4,639,371

HEPATITIS B ANTIGENIC COMPOSITIONS AND VACCINES AGAINST HEPATITIS B DERIVED THEREFROM

Alfred M. Prince, Pound Ridge, and John Vnek, Bronx, both of N.Y., assignors to New York Blood Center, Inc., New York, N.Y.

Filed Oct. 2, 1984, Ser. No. 656,833
Int. Cl.[4] A61K *39/12, 39/42;* C07K *15/04*
U.S. Cl. 424—86 44 Claims

1. A proteinaceous mass comprising particles of HBsAg, said particles being branched ring-shaped as depicted in FIG. 1*b*, open ring-shaped as depicted in FIG. 1*d*, or ring-shaped branched as depicted in FIG. 1*e*.

4,639,372

COCCIDIOSIS VACCINE

Peter K. Murray, Redbank, and Stefan Galuska, North Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 29, 1984, Ser. No. 625,882
Int. Cl.[4] A61K *39/012, 37/00*
U.S. Cl. 424—88 13 Claims

1. An extract obtained by grinding and centrifuging a suspension of sporulated oocysts of *Eimeria tenella,* and purifying sporozoites from the pelleted material resulting from the centrifugation step, the pelleted material containing antigens capable of immunizing chickens against coccidiosis.

6. A method of immunizing chickens against coccidiosis comprising administering an anti-coccidial effective dose of the extract of claim 1.

4,639,373

STABILIZATION OF GRANULOCYTES

Bernard M. Babior, Lexington, Mass., assignor to New England Medical Center Hospitals, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 676,071, Nov. 29, 1984. This application Jul. 24, 1985, Ser. No. 758,514
Int. Cl.[4] A61K *35/14*
U.S. Cl. 424—101 5 Claims

1. The method of stabilizing for storage without freezing human granulocytes obtained from blood which comprises suspending them in a non-toxic buffer containing gelatin and plasma in which the amount of said gelatin is at least 1% by weight of the total composition and less than the amount required to cause said composition to set to a gel at 40° C. or higher and the amount of said plasma is from 25 to 90% by weight of the total composition.

5. A composition comprising granulocytes suspended in a non-toxic buffer at pH 6.1 to 8.0 containing gelatin and plasma, the amount of said gelatin is at least 1% by weight of the total composition and less than the amount required to cause said composition to set to a gel at 40° C. or higher and the amount of said plasma is from 25 to 90% by weight of the total composition.

4,639,374

ALMOND NUT PASTE FOR BEVERAGES AND DESSERTS

Akira Matsunobu; Sumio Horishita, and Tetsuo Yamada, all of Hyogo, Japan, assignors to Ton Company Ltd., Japan

Continuation-in-part of Ser. No. 375,633, May 6, 1982, abandoned. This application May 8, 1984, Ser. No. 608,289
Claims priority, application Japan, Nov. 9, 1981, 56-180180
Int. Cl.[4] A23C *9/127;* A23L *2/38, 1/36, 1/221*
U.S. Cl. 426—43 9 Claims

1. A homogeneous mixture for beverages and desserts, comprising a finely ground almond paste derived from unskinned dry- or oil-roasted almonds wherein substantially all of the almonds have a maximum particle size of not more than 105 microns, with more than 80% by weight of a particle size not more than 25 microns and with more than 95% by weight of a particle size not more than 46 microns, and also containing two types of nonionic surfactants, one being selected from hydrophilic surfactants of HLB not less than 7 and the other from lipophilic surfactants of HLB not more than 6 with the mean HLB of the surfactants used being more than 10 and less than 15, and a thickener and a sugar.

7. A method of manufacturing a nut sour, which comprises suspending a nut paste comprising a finely ground almond paste derived from unskinned dry- or oil-roasted almonds substantially all of which have a maximum particle size of not more than 105 microns, with more than 80% by weight of a particle size not more than 25 microns and with more than 95% by weight of a particle size not more than 46 microns, two types of nonionic surfactants, one being selected from hydrophilic surfactants of HLB not less than 7 and the other from lipophilic surfactants of HLB not more than 6 with the mean HLB of the surfactants used being more than 10 and less than 15, a thickener and sugar in skim milk or a skim milk substitute, and subjecting the resultant suspension to a lactic fermentation.

4,639,375

ENZYMATIC TREATMENT OF BLACK TEA LEAF

Chee-Hway Tsai, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 12, 1983, Ser. No. 522,878
Int. Cl.[4] A23F *3/00;* A23B *7/10;* A23K *1/00*
U.S. Cl. 426—49 10 Claims

1. A process for increasing the yield and tea solid solubility of black tea by enzymatic treatment, comprising the steps of:

(1) wetting fermented black tea leaf prior to extraction with an enzyme solution comprising water, tannase and at least one cell-wall-digesting enzyme which breaks down one or more tea cell wall constituents to simpler materials wherein the tea leaf is combined with the enzyme solution at a tea:enzyme solution weight ratio of from about 4:1 to about 1:2.5;

(2) incubating the enzyme-wetted tea to cause partial digestion and fermentation of the tea leaf in a closed system such that volatiles are not lost or damaged;

(3) neutralizing the tea to a pH of from about 4.75 to about 5.75 with an edible base; and

(4) inactivating the enzymes by heating.

4,639,376

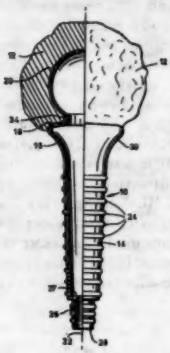
ICE CREAM HANDLE

Salvatore Saladino, 49 Poynter Dr., Etobicoke, Ontario, M9R 1L3, Canada, and Victoria M. Samson, R.R. #4, Brampton, Ontario, L6T 3S1, Canada

Filed Oct. 10, 1985, Ser. No. 786,061
Int. Cl.[4] A23G *9/26*
U.S. Cl. 426—134 5 Claims

1. A unitary handle for supporting an individual serving of pre-formed, deep-frozen ice cream for storage and consumption comprising a hand held elongated hollow gripping portion capable of fitting the contour of the hand flaring outwardly toward a top end thereof, thence extending inwardly to define a substantially flat annular surface sufficient to support an individual serving of ice cream thereon; a closed hollow head portion projecting upwardly from the annular surface sufficient to hold the individual serving of ice cream; said flat annular surface and said head portion being connected by a neck portion which is narrower than both said flat annular surface and said head portion and sufficient to retain cold air inside the head portion sufficient to retain ice cream on the surface of the head portion cold and hard; the interior of the head portion being in fluid communication with the interior of the gripping portion; the gripping portion having a bottom end remote from said top end with the bottom end having an opening to the exterior and with said opening having a cross-sec-

tional area less than about 60% of the least cross-sectional area within the gripping portion sufficient to minimize convective



heat interchange between air within the hollow gripping handle and the exterior air.

4,639,377

THIN FILM FORMATION TECHNIQUE AND EQUIPMENT

Shigehiko Yamamoto, Tokorozawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,793
Claims priority, application Japan, Apr. 24, 1984, 59-81121
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—10 **11 Claims**

1. In a thin film formation technique which sticks molecules onto a substrate and forms a thin film, the thin film formation technique comprising the steps of:

converting a molecular beam effusing from molecular beam source equipment to a pulsed molecular beam;

introducing said pulsed molecular beam into an ionization chamber so that most of said pulsed molecular beam is caused to be incident on said substrate while a part of said pulsed molecular beam is ionized by said ionization chamber;

amplifying the ion or the electron converted from the ion and converting it to an electrical signal;

calculating the flux and speed of said molecular beam in accordance with the electrical signal;

controlling said molecular beam effusing from said molecular beam source equipment on the basis of the calculation information of the flux and speed; and

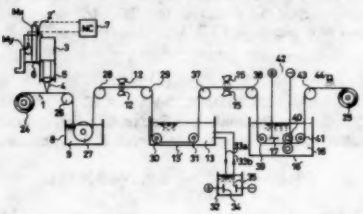
forming said thin film on said substrate.

4,639,378

AUTO-SELECTIVE METAL DEPOSITION ON DIELECTRIC SURFACES

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue Japax Research Incorporated, Kanagawaken, Japan

Filed Jan. 16, 1985, Ser. No. 691,877
Claims priority, application Japan, Jan. 17, 1984, 59-6116; Jan. 17, 1984, 59-6117
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—35 **6 Claims**



1. A method of plating a pattern of metal on a dielectric surface, comprising the steps of:

(a) masklessly treating the dielectric surface to selectively activate preselected areas thereof while said preselected areas are in contact with a priming solution so that the dielectric surface in contact with the priming solution becomes catalytic, and thereby receptive to electroless metal deposition, selectively at said preselected areas; and

(b) contacting the treated dielectric surface with an electroless plating solution to allow metal therefrom to autoreductively deposit selectively at said preselected catalyzed areas, thereby forming the pattern of metal desired on the dielectric surface.

4,639,379

METHOD FOR THE IMPROVEMENT OF ANTISTATIC PERFORMANCE OF SYNTHETIC RESIN SHAPED ARTICLES

Michihiko Asai, Ibaraki; Yukio Shimura, Kanagawa; Keishiro Tsuda, Ibaraki; Susumu Ueno, Ibaraki; Hirokazu Nomura, Ibaraki, and Kiyoshi Imada, Saitama, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 441,935, Nov. 15, 1982, abandoned. This application Jun. 11, 1985, Ser. No. 743,874
Claims priority, application Japan, Nov. 16, 1981, 56-183346
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—40 **6 Claims**

1. A method for improving the antistatic performance of a shaped article of a synthetic resin which comprises the steps of

(a) forming a crosslinked layer in at least the surface portion of the shaped article, and

(b) exposing the surface of the shaped article thus provided with the crosslinked layer to low temperature plasma generated in an atmosphere containing a gaseous silicon compound represented by the general formula

$$R_aH_bSiX_{4-a-b}$$

in which R is a substituted or unsubstituted monovalent hydrocarbon group, X is a halogen atom or an alkoxy group, a is an integer of 0, 1, 2 or 3 and b is an integer of 0 or 1 with the proviso that a+b is not exceeding 3, or a hydrolysis-condensation product thereof, to form a plasma-polymerized surface film of the silicon compound having a thickness of at least 5 nm on the surface of the shaped article.

4,639,380

PROCESS FOR PREPARING A SUBSTRATE FOR SUBSEQUENT ELECTROLESS DEPOSITION OF A METAL

William J. Amelio; David W. Hume; Donald G. McBride, all of Binghamton, and Robert G. Rickert, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1985, Ser. No. 730,918
Int. Cl.[4] H05K *3/42*
U.S. Cl. 427—97 20 Claims

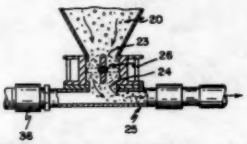
1. A process for preparing a substrate for the electroless deposition of a metal thereon which comprises contacting the substrate with a surfactant and with an organic carboxylic acid, and then contacting said substrate with an aqueous sulfuric acid solution containing about 2% to about 20% by volume of sulfuric acid.

4,639,381

METHOD FOR REDUCING FIRESIDE TUBE DEPOSITION AND BOILER SOOTBLOWING REQUIREMENTS

Robert B. Wierzba, Bridgeview; Robert G. Snyder, Palos Heights, and Blaise H. Kleefisch, Riverdale, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 533,568, Sep. 19, 1983, Pat. No. 4,545,411.
This application Jun. 19, 1985, Ser. No. 746,378
Int. Cl.[4] B05D *1/12*
U.S. Cl. 427—156 3 Claims



1. The method of operating a dry product feeding apparatus to periodically feed measured amounts of a dry product into a kraft recovery boiler in timed relation to a sootblowing cycle to coat the fireside surfaces of the sootblown heat exchanger tubes and establish a cleavage plane to inhibit deposit formation, wherein said apparatus includes a vessel having an inlet into which a measured amount of said product is fed by a metering device and an outlet connected to an air supply line, said air supply line being connected to an air supply upstream from the vessel and the boiler downstream from the vessel, a control valve in said line upstream from the vessel to selectively turn the air supply on and off, valves at said inlet and said outlet for controlling the passage of product into and out of said vessel, and a programmable relay for sequentially operating said air supply valve, said inlet and outlet valves and said metering device, said method comprising the steps of, opening the air supply valve to blow the air supply line clear, opening the outlet valve to allow the product to enter the air supply line and be blown into the boiler, closing the outlet valve and allowing the air supply to continue to blow the line clear, closing the air supply valve and opening the inlet valve, turning on the metering device and charging the vessel with a subsequent measured amount of product, and turning off the metering device and closing said inlet valve.

4,639,382

METHOD OF PROVIDING A METAL MIRROR ON A SURFACE MANUFACTURED FROM AN ACRYLATE SYNTHETIC RESIN OR A METHACRYLATE SYNTHETIC RESIN

Johannes J. Ponjee, and Christiaan J. A. Verwijlen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,535
Claims priority, application Netherlands, Jul. 14, 1982, 8202842
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—162 2 Claims

1. A method of providing a metal mirror on an article of which at least the surface on which the metal mirror is to be provided is formed of an acrylate synthetic resin or a methacrylate synthetic resin, characterized in that said surface is treated with a solution of tannin in a mixture of water and from 2% by volume up to the saturation concentration of a water-miscible organic solvent selected from the group consisting of water-miscible organic acids, alcohols, ethers, ketones and esters, and a metal mirror is then provided on said treated surface by use of an electroless metallization process.

4,639,383

METHOD AND APPARATUS FOR COATING PARTICULATE GRANULES

Thomas J. Casey, Barrington Hills, Ill., assignor to Thomas Engineering, Inc., Hoffman Estates, Ill.

Continuation of Ser. No. 534,185, Sep. 20, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 854,735
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—213 32 Claims

18. A method of coating particulate granules, comprising:
agitating a charge of particulate granules by tumbling the granules in a rotating pan and simultaneously fluidizing the granules with a stream of flowing gas, with at least a portion of the rotating pan's surface being porous, and with fluidizing of the granules being accomplished by injecting the stream of flowing gas through the pan's porous surface into the charges of granules;
drawing a portion of the agitated granules from the charge by the application of a means for drawing gas through the pan's porous surface in the vicinity of the agitated charge, which means simultaneously exhausts the flowing gaseous medium from the granules;
cascading the drawn granules back into the agitated charge; and
dispensing a coating material upon the granules.

4,639,384

METHOD OF CASTING URETHANE ELASTOMER ON METAL

Sumio Umemoto; Eiichi Hattori, and Ryutaro Kamakari, all of Osaka, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Jan. 27, 1986, Ser. No. 822,808
Claims priority, application Japan, Jan. 28, 1985, 60-14968
Int. Cl.[4] B05D *5/00, 3/12;* B32B *31/00*
U.S. Cl. 427—290 13 Claims

1. A method for adhering an urethane elastomer to a metal

which comprises applying a thermosetting resin containing a flaky inorganic filler to a surface of a metal matrix, curing the thermosetting resin layer, applying an isocyanate-terminated prepolymer thereon, curing the prepolymer layer, and casting an urethane elastomer stock solution over the cured laminate.

4,639,385

HIGH VOLTAGE HIGH VACUUM COATING

William L. Jolitz, San Jose, and Richard A. Williams, Palo Alto, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Sep. 30, 1985, Ser. No. 781,544
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—386 16 Claims

1. A conformal coating for electrical components, comprising:

particles of elemental boron having a maximum particle size of 20 microns and uniformly dispersed throughout an organic binder having a secondary electron emission coefficient approximately equal to 1; wherein

the surface resistivity of the coating is between a preselected minimum and 10^{12} ohms per square, said preselected minimum being equal to a hundred times the highest resistance of the electrical components being coated; and

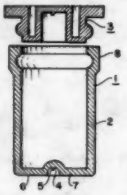
the thickness of the coating is less than 0.01 inch.

4,639,386

CONTAINER FOR PHOTOGRAPHIC FILM CARTRIDGE

Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 31, 1985, Ser. No. 696,763
Claims priority, application Japan, Feb. 3, 1984, 59-18084; Feb. 22, 1984, 59-24331[U]
Int. Cl.[4] B27N 5/02
U.S. Cl. 428—35 10 Claims



1. A container for a photographic film cartridge having a mean peripheral wall thickness of from 0.5 to 1.0 mm, and which is molded from a resin, comprising a polymer of which the content of propylene unit is more than 70 weight %, and wherein said resin has a melt index of 16 to 80 g/10 minutes, a yielding point of tensile stress of higher than 250 kg/cm^2, a bending elastic modulus of higher than 10,000 kg/cm^2, and a notched impact strength at 20° C. measured by an Izod testing machine of higher than 2.0 kg.cm/cm.

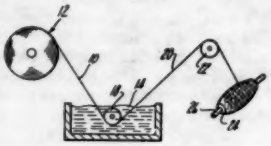
4,639,387

FIBROUS ARMOR MATERIAL

Joseph N. Epel, Southfield, Mich., assignor to Budd Company, Troy, Mich.

Continuation of Ser. No. 488,557, Apr. 25, 1983, abandoned.
This application Jan. 18, 1985, Ser. No. 693,218
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—113 8 Claims

1. An armor material suitable for resisting substantial impacts comprising: a plurality of monofilament fibers disposed within said material, said fibers being disposed in successive alternating and separate layer, the fiber axis in any given layer being substantially parallel to each other to form a thin layer having a thickness equal to the diameter of the fibers, the fiber axes in layers adjoining said given layer being disposed substantially parallel to each other and at angles to the fiber axis in said given layer to form a multiplicity of cross over points; a resinous material surrounding and consolidating said fibers into a three-dimensional structure to form a resin matrix, said resinous material having adhesion to said fibers less than the



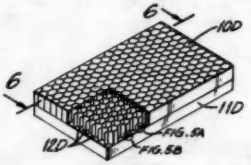
cohesive strength of said fibers to afford movement of the fibers relative to said matrix upon application of impact force to said armor material whereby a substantial amount of the impact force will be absorbed longitudinally along the axes of the fibers.

4,639,388

CERAMIC-METAL COMPOSITES

John H. Ainsworth, and Robert E. Shepler, both of Richardson, Tex., assignors to Chromalloy American Corporation, Dallas, Tex.

Filed Feb. 12, 1985, Ser. No. 701,022
Int. Cl.[4] B32B 3/12
U.S. Cl. 428—117 54 Claims



1. A reinforced composite structure comprising a heat resistant chemically-bonded layer of a ceramic composition mechanically attached to a metallic substrate,

said structure including a metallic anchoring matrix characterized by a plurality of spatially and cooperably arranged reinforcing elements,

said matrix being substantially uniformly attached over the surface of said substrate and projecting from the surface thereof with the spatially arranged reinforcing elements of said matrix collectively defining a ceramic-occupiable zone of finite thickness adjacent to and following the surface configuration of said substrate,

said zone having at least confined therein said heat resistant chemically-bonded ceramic composition in intimate and mechanically-bonded contact with said reinforcing elements,

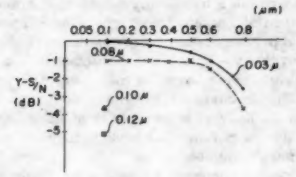
said chemically-bonded ceramic composition having been produced by mixing a low-temperature chemical bonding agent with said ceramic composition and heating said composition to a low temperature below the normal sintering temperature of said ceramic when the low-temperature chemical bonding agent is not present, said chemical bonding temperature being below about 1095° C.,

whereby said composition of reinforced heat resistant ceramic is strongly mechanically bonded as a layer to said substrate by virtue of said metallic matrix attached to said substrate.

4,639,389
MAGNETIC RECORDING MEDIUM

Masaharu Nishimatsu, Komoro; Toshiaki Ide, and Hiroyuki Arioka, both of Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 12, 1984, Ser. No. 680,889
Claims priority, application Japan, Dec. 12, 1983, 58-232777; Dec. 12, 1983, 58-232778
Int. Cl.[4] G11B 5/72
U.S. Cl. 428—141 10 Claims



1. A magnetic recording medium comprising a plastic base film, a magnetic layer formed on one side of the base film and a backing layer formed on the other side of the base film, characterized in that said magnetic layer has a surface roughness of at most 0.08 μm, and said backing layer having a surface roughness of from 0.05 to 0.6 μm and is composed essentially of first particles of an inorganic pigment having an average particle size of from 0.02 to 0.5 μm and a Mohs hardness of from 2 to 4 and second particles of an inorganic pigment having an average particle size of from 0.04 to 0.5 μm and a Mohs hardness of from 5 to 7 present in a weight ratio of 1:9 to 5:5, dispersed in a thermoset or radiation-cured binder the ratio of the total of said particles to said binder being 4:1 to 1:1.

4,639,390
PREPARATION OF NON-WOVEN FABRIC CONTAINING POLYVINYL ALCOHOL FIBER

Rikuo Shoji, Moriyama, Japan, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Nov. 1, 1985, Ser. No. 794,115
Claims priority, application Japan, Nov. 27, 1984, 59-250968
Int. Cl.[4] B32B 3/00
U.S. Cl. 428—195 18 Claims

1. A method for preparation of non-woven fabric which contains polyvinyl alcohol fibers comprising:

forming a web containing slightly soluble polyvinyl alcohol fiber which is soluble or swellable in the presence of water at a temperature of 90° C. or higher in the amount of at least 10% by weight;

providing water in said web to obtain a water content of at least 20% by weight; and

partially thermally bonding the web so that the bonded area occupies 5 to 40% of the web area.

4,639,391
THICK FILM RESISTIVE PAINT AND RESISTORS MADE THEREFROM

Charles C. Y. Kuo, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Mar. 14, 1985, Ser. No. 711,983
Int. Cl.[4] H01B 1/06
U.S. Cl. 428—210 20 Claims

1. A base metal resistor paint having a controlled sheet resistance and TCR, which comprises:

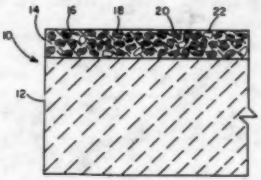
(a) mixing a glass frit selected from a quantity of at least one of a first and second glass material, the first glass material comprising 5 to 10% SiO_2, 30 to 50% BaO, 40 to 60% B_2O_3 and 1 to 5% CuO; and the second glass material comprising 50 to 70% B_2O_3, 25 to 40% SrO, and 2 to 10% SiO_2;

(b) mixing 45 to 60% of the glass frit with from 10 to 30% of a mixture comprising $TiSi_2$ and at least one of Ti_5Si_3 and Al_2O_3; and

(c) blending the glass frit and the mixture of $TiSi_2$ and at least one of Ti_5Si_3 and Al_2O_3 with from 18 to 35% of a screening agent to form a resistor paint therefrom, for subsequent screening upon a substrate and firing in an inert atmosphere to form a resistor exhibiting controlled sheet resistance and TCR.

17. A thick film base metal resistor having a substrate with a resistive paint screened and fired thereon, wherein the improvement comprises:

(a) controllably blending a glass frit selected from at least one of a first and second glass material, the first glass material comprising 5 to 10% SiO_2, 30 to 50% BaO, 40 to



60% B_2O_3 and 1 to 5% CuO; and the second glass material comprising 50 to 70% B_2O_3, 25 to 45% SrO, and 2 to 10% SiO_2;

(b) mixing 45 to 65% of the blended glass frit with 10 to 30% of a selected mixture comprising $TiSi_2$ and at least one of Ti_5Si_3 and Al_2O_3;

(c) screening the resistive paint onto a substrate;

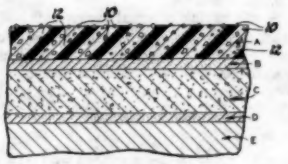
(d) drying the screened substrate in air prior to firing; and

(e) firing the screened substrate in an inert atmosphere at a peak firing temperature of approximately 900° C., wherein the selected quantity of the first and second glass material and the selected mixture of $TiSi_2$ and at least one of Ti_5Si_3 and Al_2O_3, provide a means to control the sheet resistivity and the TCR of the base metal resistor made therefrom.

4,639,392
CLUTCH PLATE MEMBER HAVING LAYER OF HIGH DURABILITY, SELF-CONFORMING FRICTION FACING

Terry E. Nels, Xenia; Larry Eldridge, Dayton, and Gerald L. Doty, Miamisburg, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1985, Ser. No. 792,110
Int. Cl.[4] B32B 5/16
U.S. Cl. 428—283 6 Claims



1. A clutch plate member for operating in a fluid medium to transmit torque to a metal mating surface situated on an opposing clutch plate member in a wide range of slip speeds, said clutch plate member comprising a friction facing layer consisting of thermoset resin bonded carbon particles bonded to a compliant carrier sheet which is in turn bonded to a metal support plate, said compliant carrier sheet improving the conformability of said friction facing layer to said metal mating surface resulting in a reduction in the maximum operating

temperature of said friction facing layer by at least five percent.

4,639,393

DISPENSERS FOR THE CONTROLLED RELEASE OF PEST-CONTROLLING AGENTS AND METHODS FOR COMBATTING PESTS THEREWITH

Henry Von Kohorn, Greenwich, Conn., and Agis F. Kydonieus, Kendall Park, N.J., assignors to Herculite Protective Fabrics Corporation, New York, N.Y.

Division of Ser. No. 764,312, Jan. 31, 1977, Pat. No. 4,160,335, which is a continuation of Ser. No. 535,658, Dec. 23, 1974, abandoned, which is a continuation of Ser. No. 305,032, Nov. 9, 1972, abandoned. This application Nov. 17, 1978, Ser. No. 961,893

Int. Cl.[4] A01M *1/14*

U.S. Cl. 428—304.4 28 Claims

1. A dispenser for the maintenance in an active state and the controlled release of at least one active pheromone agent consisting of a laminated article which comprises:

at least a first solid, non-porous, polymeric wall element having at least a first outer surface exposed to the environment of said dispenser,

a second wall element providing a second outer surface exposed to the environment of said dispenser,

at least one inner layer of said laminate between said first and second wall element comprising a layer of a solid, polymeric composition, said inner layer comprising:

at least one active pheromone agent which is capable of migrating through said first wall element and is present in said inner layer in sufficient amount so that upon migration of at least a portion of said pheromone agent through said first wall element an effective level of said active pheromone agent is present on said first outer surface of said wall element, said active pheromone agent having a rate of migration through said wall element such that said active pheromone agent becomes available on said first outer surface of said first wall element and in the surrounding environment of said dispenser in accordance with a detailed dosage regimen for effective attraction of a target pest species,

said dispenser having physical dimensions adapted to allow spraying of said dispenser by entrainment in a carrier fluid, and wherein the outer surfaces of the dispenser are coated with a slip promoting agent to facilitate entrainment and dispersion in said carrier fluid.

4,639,394

NON-AQUEOUS DISPERSIONS PREPARED WITH STYRENE POLYMER DISPERSION STABILIZERS

Suryya K. Das, Pittsburgh, and Rostyslaw Dowbenko, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1985, Ser. No. 718,756

Int. Cl.[4] C08K *5/01;* C08L *53/00;* B22B *5/16, 27/06*

U.S. Cl. 428—327 37 Claims

1. A non-aqueous dispersion of polymeric particles having an average particle size ranging from 0.1 to 10 microns in an organic dispersing liquid which is formed by the free radical initiated addition polymerization of 20 to 70 percent by weight of a polymerizable ethylenically unsaturated monomer component in 25 to 80 percent by weight of the dispersing liquid; the polymerization being conducted in the presence of 1 to 25 percent by weight of a dispersion stabilizer, the percentage by weight being based on total weight of polymerizable ethylenically unsaturated monomer component, dispersing liquid and stabilizer, characterized in that the dispersion stabilizer is a styrene polymer and containing ethylenic unsaturation in only the terminal position.

14. A polymeric microparticle having an average particle size ranging from 0.1 to 10 microns which is prepared by free radical addition polymerization of 20 to 70 percent by weight of a polymerizable ethylenically unsaturated monomer component in 20 to 85 percent by weight of an organic dispersing liquid, said polymerization being conducted in the presence of 1 to 25 percent by weight of a dispersion stabilizer, the percentage by weight being based on total weight of polymerizable ethylenically unsaturated monomer component, dispersing liquid and stabilizer, characterized in that the dispersion stabilizer is a styrene polymer containing ethylenic unsaturation is the terminal position only.

24. A coating composition comprising a solution of a film-forming polymer in combination with polymeric microparticles which are insoluble in the film-forming polymer solution; said polymeric microparticles having an average particle size ranging from 0.1 to 10 microns being prepared by free radical addition polymerization in an organic dispersing liquid of 20 to 70 percent by weight of a polymerizable ethylenically unsaturated monomer component in 25 to 80 percent by weight of the dispersing liquid, said polymerization being conducted in the presence of 1 to 25 percent by weight of a dispersion stabilizer, the percentage by weight being based on total weight of polymerizable ethylenically unsaturated monomer component, dispersing liquid and stabilizer, characterized in that the dispersion stabilizer is a styrene polymer containing ethylenic unsaturation in only the terminal position.

35. A coated article comprising a substrate and a coating containing the polymeric microparticle of claim 14 adhered thereto.

4,639,395

PREPASTED WALLCOVERINGS

John B. Clarke, and John F. Firth, both of West Yorkshire, England, assignors to Allied Colloids Limited, Great Britain

Filed Mar. 14, 1985, Ser. No. 711,615

Claims priority, application United Kingdom, Mar. 15, 1984, 8406783

Int. Cl.[4] C09J *7/02;* B05D *5/10*

U.S. Cl. 428—341 16 Claims

1. A prepasted wallcovering comprising a substrate carrying a water-moistenable prepaste coating formed of at least two layers and consisting essentially of an anionic polymer that is substantially non-swellable in water and that is swellable in the presence of aqueous alkali, the anionic polymer being present in an amount in the range of 3 to 20 grams per square meter of substrate, an alkaline material that on contact with water will form said aqueous alkali, said alkaline material being present in an amount in the range of 0.2 to 5.0 grams per square meter of substrate and a water-soluble cationic polymer present in an amount in the range of from 0.1 to 3.0 grams per square meter of substrate, said anionic polymer and said alkaline material being in separate layers.

9. A process for producing a wallcovering comprising a substrate carrying a water-moistenable prepaste coating formed of at least two layers and consisting essentially of an anionic polymer which is substantially non-swellable in water and is swellable in aqueous alkali, the anionic polymer being present in an amount in the range of 3 to 20 grams per square meter of substrate, an alkaline material that on contact with water will form said aqueous alkali, said alkaline material being present in an amount in the range of 0.2 to 5.0 grams per square meter of substrate and a water-soluble cationic polymer present in an amount in the range of 0.1 to 3.0 grams per square meter of substrate, said process comprising applying an aque-

ous dispersion of substantially unswollen particles of the anionic polymer to the substrate in one of said layers, applying the cationic polymer to the substrate from aqueous solution, applying the alkaline material to the substrate from aqueous solution and drying the coated substrate.

4,639,396

THERMOPLASTICS-METAL FIBER THREADS

Mohammad A. Semsarzadeh, Bethesda, Md., assignor to Princeton Polymer Laboratories, Plainsboro, N.J.

Filed Jul. 19, 1984, Ser. No. 632,466
Int. Cl.⁴ B32B *27/18, 31/30;* C08K *7/04;* H01B *1/06*
U.S. Cl. 428—373 7 Claims

1. An extrusion drawn oriented elongated filament comprising a minor proportion of elongated metal fiber embedded in a major proportion of thermoplastic polymer by weight wherein the melting temperature of said metal is within the softening to molten range of said polymer and wherein said metal fiber is unidirectional and extends into the elongated length of said polymer, said drawing having been accomplished while the metal is in the molten condition and the extrusion is carried out by simultaneously extruding the metal and polymer.

4,639,397

THICK AND THIN FIBER HAVING GROOVES ON ITS SURFACE AND PROCESS FOR PRODUCING THE SAME

Yoshiaki Sato, and Hisao Suzuki, both of Mishima, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,445
Claims priority, application Japan, Apr. 15, 1983, 58-65273
Int. Cl.⁴ D02G *3/00*
U.S. Cl. 428—397 7 Claims

1. A thick and thin fiber comprised of a thermoplastic polymer, said fiber being alternatingly thick and thin along its longitudinal axis and having at least two axially continuous grooves on its surface, each groove having an entrance width of 0.2 to 4μ and a depth of 0.1 to 1.8μ.

4,639,398

COMPOUND FILM CONTAINING OLEFIN

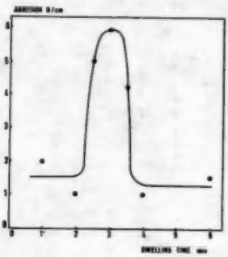
Christer Bergström, Helsinki, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI83/00013, § 371 Date Sep. 13, 1984, § 102(e) Date Sep. 13, 1984, PCT Pub. No. WO84/03240, PCT Pub. Date Aug. 30, 1984
PCT Filed Feb. 17, 1983, Ser. No. 653,230
Int. Cl.⁴ B32B *27/32, 13/12, 27/08;* C08L *51/06*
U.S. Cl. 428—451 20 Claims

1. A multilayer compound film including at least one layer of polyolefin in contact with a polymer containing polar radicals, said polyolefin layer having between 0.01–10% of an unsaturated alkoxysilane grafted thereon and wherein the alkoxy groups thereof are unhydrolyzed and therefore reactable to adhere the polyolefin to the polymer containing the polar radicals.

15. A method of forming a multilayer compound film including at least one layer of polyolefin in contact with a polymer containing polar radicals, said method comprising the steps of

(a) admixing between 0.01–10% of an unsaturated alkoxysilane and 0.01–0.5% of a radical former, under conditions where no grafting of the silane takes place,



(b) then grafting the thus-admixed alkoxysilane onto the polyolefin layer to be modified, and

(c) forming a multilayer compound film.

4,639,399

NICKEL OXIDE, CERAMIC INSULATED, HIGH TEMPERATURE COATING

Louis F. Aprigliano, Riva, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 26, 1985, Ser. No. 801,895
Int. Cl.⁴ F01D *5/28;* B32B *15/04*
U.S. Cl. 428—623 18 Claims

1. A corrosion, oxidation, and heat resistant layered coating for a substrate material in a high temperature, corrosive environment, consisting of:

a base layer selected from the group consisting of Aluminide and MCrAlY, wherein M is a metal selected from the group consisting of nickel, cobalt, and a combination thereof;

a ceramic layer, impermeable to the metallic elements of said substrate material and said MCrAlY layer, and bonded to said substrate material by said MCrAlY layer; and,

a nickel oxide layer, applied to said ceramic layer.

4,639,400

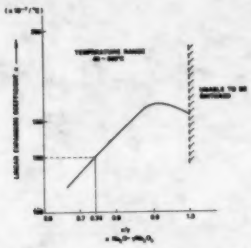
CERAMIC SUBSTRATE OF NA_2O AND NB_2O_5 FOR MAGNETIC METAL THIN FILM

Takashi Yamaguchi, Tokyo; Nr.omi Nagasawa, and Hidemasa Tamura, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 10, 1985, Ser. No. 786,464
Claims priority, application Japan, Oct. 12, 1984, 59-213594
Int. Cl.⁴ B32B *9/00, 18/00*
U.S. Cl. 428—694 3 Claims

1. A thin film magnetic head having a base and a magnetic

alloy film deposited thereon, said base being composed of a ceramic composition having the general formula:



$xNa_2O \cdot yNb_2O_5$ wherein the ratio x/y is at least 0.74 but less than 1.00, said ceramic composition having a coefficient of thermal expansion of at least 130×10^{-7}/° C.

4,639,401

SURFACTANT ADDITION TO PHOSPHORIC ACID ELECTROLYTE

John F. Jackovitz, Monroeville, and Richard P. Kunkle, Irwin, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 26, 1986, Ser. No. 832,785
Int. Cl.[4] H01M 8/10
U.S. Cl. 429—30 **4 Claims**

1. A fuel cell comprising a container having disposed therein: a cathode, an anode, a divider positioned between said cathode and anode to separate said cathode and anode one from the other and an electrolyte comprising H_3PO_4 and at least about 0.5 wt. percent of an amine capable of reacting with said H_3PO_4 in situ to produce an ammonium phosphate thereby reducing interfacial tension and increasing the wetting properties of said H_3PO_4.

4,639,402

PHOTORECEPTOR CONTAINING SELENIUM PARTICLES COATED WITH A REACTION PRODUCT OF A HYDROLYZED SILANE

Satchidanand Mishra, and Leon A. Teuscher, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1985, Ser. No. 761,931
Int. Cl.[4] G03G 5/087
U.S. Cl. 430—58 **15 Claims**

1. An electrostatographic imaging member comprising a photoconductive layer comprising an organic resin binder and photoconductive particles consisting essentially of selenium coated with a thin layer of a reaction product of a hydrolyzed aminosilane.

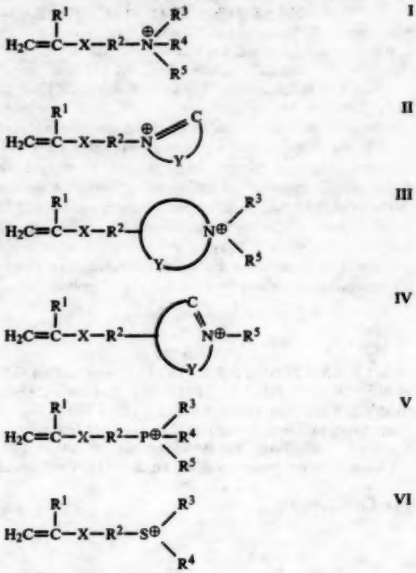
4,639,403

ELECTROSTATOGRAPHIC SUSPENSION DEVELOPER AND A PROCESS FOR ITS PREPARATION COMPRISING QUATERNARY IONIC COPOLYMER FOR POSITIVE TONER CHARGE

Wolfgang Podszün; John Goossens, both of Cologne; Carlhans Süling, Odenthal; Günther Hoffarth, Leverkusen; Wolfgang Richter, Krefeld, all of Fed. Rep. of Germany; Herman Uyterhoeven, Bonheiden, and Walter de Winter, Grafenwezen, both of Belgium, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 5, 1985, Ser. No. 752,095
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426256
Int. Cl.[4] G03G 9/12
U.S. Cl. 430—115 **7 Claims**

1. An electrostatographic suspension developer containing a dispersed pigment and at least one ionic copolymer to produce a positive toner charge in an electrically insulating carrier liquid having a volume resistivity of at least 10^9 ohm.cm and a dielectric constant below 3, characterized in that the copolymer is formed from cationic monomers in which the cations of the monomers correspond to the following general formulae



I

II

III

IV

V

VI

in which

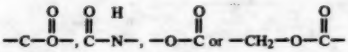
R^1 is a hydrogen atom or a CH_3-group,

R^2 is a C_1–C_{18} hydrocarbon radical,

R^3 and R^4 may be the same or different and represent a C_1–C_{18} hydrocarbon radical or together form a 5- or 6-membered ring,

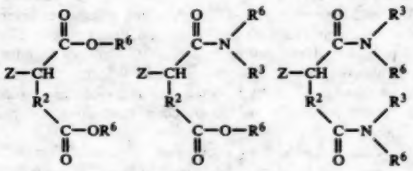
R^5 is a hydrogen atom or a C_1–C_{18} hydrocarbon radical,

X is one of the groups



and

Y represents the atoms required to complete a 5- or 6-membered heterocyclic ring, and the anions of the cationic compounds correspond to the following general formulae



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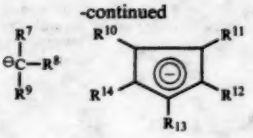


XII XIII

in which

Z is one of the groups $-SO_3^{\ominus}$ or

R^2 and R^3 each represent a C_1–C_{18} hydrocarbon radical

R^6 is a C_6–C_{24} hydrocarbon radical,

R^7 is one of the groups $-COOR^6$ or $-SO_2R^6$,

R^8 and R^9 may be the same or different and represent one of the groups —CN, $-CO_2$, —halogen, —COOR or $-SO_2R$,

R^{10} has the same meaning as R^6 or is a $-COOR^6$ group,

R^{11} is one of the groups —CN or —COOR and

R^{12}, R^{13} and R^{14} may be the same or different and represent a hydrogen atom or the groups —CN, —R or —COOR, R is a C_1–C_{24} hydrocarbon radical.

4,639,404

LIQUID DEVELOPER FOR DEVELOPMENT OF ELECTROSTATIC IMAGES

Herman J. Uytterhoeven, Bonheiden; Walter F. De Winter, 's-Gravenwezel, and August M. Mariën, Oevel, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Sep. 26, 1985, Ser. No. 780,584

Claims priority, application European Pat. Off., Oct. 2, 1984, 84201398

Int. Cl.[4] G03G 9/12

U.S. Cl. 430—115 **10 Claims**

1. A liquid developer composition that is suitable for rendering visible electrostatically charged areas, which composition contains in an electrically insulating non-polar carrier liquid having a volume resistivity of at least 10^9 ohm.cm and a dielectric constant less than 3, dispersed colouring matter acting as toner particles and at least one anionic addition polymer comprising anionic groups neutralized with non-polymeric counter cations, characterized in that said cations are positively charged metal ion containing coordination compounds.

4,639,405

METHOD AND APPARATUS FOR FIXING TONER IMAGES

Hans G. Franke, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,363

Int. Cl.[4] G03G 13/20, 15/20

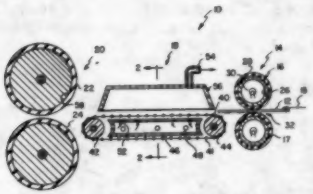
U.S. Cl. 430—124 **13 Claims**

1. A method of fixing a toner image on a copy sheet, said method comprising the steps of:

(a) fixing a toner image to copy sheets moveable along a copy sheet path; and

(b) removing from about 50% to about 80% of the moisture content of a copy sheet bearing a toner image; and

(c) passing said copy sheet through surfacing means to provide a gloss to the toner image, said surfacing means



following said fuser means and said conditioner means along said copy sheet path.

4,639,406

LIGHT-SENSITIVE COMPOUND, LIGHT-SENSITIVE MIXTURE, AND LIGHT-SENSITIVE COPYING MATERIAL PREPARED THEREFROM WITH 0-NAPHTHOQUINONE DIAZIDE COMPOUND

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

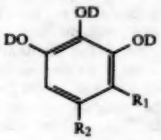
Filed Oct. 20, 1981, Ser. No. 313,232

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040156

Int. Cl.[4] G03C 1/54, 1/94; G07C 113/00

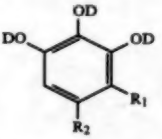
U.S. Cl. 430—165 **7 Claims**

1. A light-sensitive mixture which contains a 1,2-naphthoquinone-2-diazide-4- or -5-sulfonic acid ester of a gallic acid alkyl ester or of a pyrogallyl alkyl ketone and a water-insoluble resinous binder, which is soluble or at least swellable in aqueous-alkaline solutions, wherein the naphthoquinone diazide sulfonic acid ester corresponds to the general formula I



in which D is a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical or a 1,2-naphthoquinone-2-diazide-5-sulfonyl radical, R_1 is a hydrogen atom or a $-COC_nH_{2n+1}$ radical, and R_2 is a hydrogen atom or a $-CO-OC_nH_{2n+1}$ radical, n being an integer from 10 to 25 and the sum of the carbon atoms of R_1+R_2 being n+1.

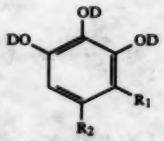
4. A light-sensitive copying material, composed of a support and a light-sensitive layer which contains a 1,2-naphthoquinone-2-diazide-4- or -5-sulfonic acid ester of a gallic acid alkyl ester or of a pyrogallyl alkyl ketone and a water-insoluble resinous binder, which is soluble or at least swellable in aqueous-alkaline solutions, wherein the naphthoquinone diazide sulfonic acid ester corresponds to the general formula I



in which D is a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical or a 1,2-naphthoquinone-2-diazide-5-sulfonyl radical, R_1 is a hydrogen atom or a $-COC_nH_{2n+1}$ radical, and R_2 is a hydrogen atom or a $-CO-OC_nH_{2n+1}$ radical, n being an inte-

ger from 10 to 25, and the sum of the carbon atoms of R_1+R_2 being n+1.

6. A 1,2-naphthoquinone-2-diazide-4- or -5-sulfonic acid ester of a gallic acid alkyl ester or of a pyrogally alkyl ketone, wherein the sulfonic acid ester corresponds to the general formula I



in which D is a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical or a 1,2-naphthoquinone-2-diazide-5-sulfonyl radical, R_1 is a hydrogen atom or a $-COC_nH_{2n+1}$ radical, and R_2 is a hydrogen atom or a $-CO-CO_nH_{2n+1}$ radical, n being an integer from 10 to 25, and the sum of the carbon atoms of R_1+R_2 being n+1.

4,639,407

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL USED IN SILVER SALT TRANSFERS

Toshiaki Aono, and Hiroshi Hara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 18, 1985, Ser. No. 712,499

Claims priority, application Japan, Mar. 16, 1984, 59-50658

Int. Cl.[4] G03C *5/54*

U.S. Cl. 430—203 **12 Claims**

1. A method for forming a silver image which comprises imagewise exposing and heating a heat-developable light-sensitive material containing a light-sensitive silver halide and an organic silver salt oxidizing agent to result in exposed and unexposed silver halide, the imagewise exposing and heating resulting in the imagewise production of a moveable silver salt in the presence of a reducing agent and a silver halide solvent, the reducing agent being present in an amount of from about 0.1 to about 20 mols per mol of the total amount of the silver halide and organic silver salt oxidizing agent, said unexposed silver halide reacting with said silver halide solvent to form said movable silver salt and said movable silver salt then diffusing due to said heating to a silver salt fixing layer comprising a silver precipitate to form a silver image corresponding to said movable silver salt.

4,639,408

PROCESS FOR IMAGE FORMATION COMPRISING A HEATING STEP

Hiroshi Kitaguchi, and Masatoshi Kato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

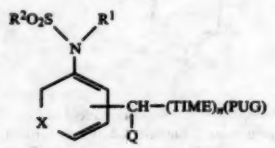
Filed Nov. 20, 1985, Ser. No. 799,996

Claims priority, application Japan, Nov. 21, 1984, 59-246468

Int. Cl.[4] G03C *1/40, 5/54, 1/06, 1/42*

U.S. Cl. 430—351 **12 Claims**

1. A process for forming an image comprising a heating step wherein a silver halide light-sensitive photographic material is heated in the presence of a compound represented by formula (I)



(I)

wherein X represents an atomic group completing a carbocyclic aromatic ring or a heterocyclic aromatic ring; R^1 is selected from groups represented by formulae (A), (B), and (C)

(A)

(B)

(C)

in which R^{11} and R^{12} each represents a substituted or unsubstituted alkyl group, a cycloalkyl group, a substituted or unsubstituted alkenyl group, an aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, an alkyloxy or aryloxy group, an alkylthio or arylthio group, or a substituted or unsubstituted amino group, or R^{11} and R^{12} together form a 5-membered or 6-membered ring; R^2 represents a group selected from the groups represented by R^{11}; R^1 and R^2 together form a 5-membered or 6-membered ring; Q represents a hydrogen atom, an alkyl group, or an aryl group; TIME represents a timing group; PUG represents a photographically useful group; and n represents 0 or an integer, wherein the photographic material contains a base or a base precursor.

10. A process as in claim 1, wherein PUG represents a photographically useful reagent selected from an antifoggant, a development restrainer, a developing agent, a development accelerator, an electron donor, a fogging agent, a nucleus-forming agent, a solvent for silver halide, a dye, a colored material for color diffusion transfer, and a coupler.

4,639,409

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

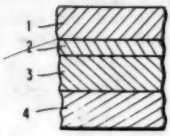
Soichiro Yamamoto, Kanagawa, and Takeo Shimada, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1985, Ser. No. 725,199

Claims priority, application Japan, Apr. 19, 1984, 59-79162

Int. Cl.[4] G03C *1/40, 1/46, 7/20*

U.S. Cl. 430—505 **4 Claims**



1. A silver halide color photographic light-sensitive material comprising a support having thereon, in succession, a 1st silver halide photographic light-sensitive emulsion layer, a photographic auxiliary layer, and a 2nd silver halide photographic light sensitive emulsion layer, or a support having on one side thereof a 1st silver halide photographic light-sensitive emulsion layer and on the other side thereof, in succession, a photographic auxiliary layer and a 2nd silver halide photographic light-sensitive emulsion layer, said photographic auxiliary layer comprising a hydrophilic colloid having dispersed therein at least one kind of white pigment having a mean particle size of 0.1 to 1.0μ in an amount of at least 10% by weight, having a thickness of 0.5 to 5μ, having a spectral

reflectance of not less than 20% in a wavelength range of 410 nm to 700 nm and having a spectral transmittance of not less than 5% in said wavelength range.

2. The silver halide color photographic light-sensitive material as claimed in claim 1, wherein the 1st silver halide photographic light-sensitive emulsion layer and the 2nd silver halide photographic light-sensitive emulsion layer each comprises a blue-sensitive emulsion layer, a green-sensitive emulsion layer, and a red-sensitive emulsion layer.

4,639,410
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT SENSITIVE-MATERIAL

Yoshihara Mochizuki, Hachioji; Sohei Goto, Hino; Toshihiko Yagi, Kanagawa; Katsumasa Yamazaki, Hachioji, and Kenji Michiue, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Feb. 1, 1985, Ser. No. 697,458
Claims priority, application Japan, Feb. 2, 1984, 59-17955
Int. Cl.[4] G03C 1/76
U.S. Cl. 430—506 17 Claims

1. In a silver halide color photographic light-sensitive material comprising a support having thereon at least one light-sensitive layer comprised of a plurality of silver halide emulsion layers substantially identical in the color sensitivity but differing in the speed,

wherein said at least one light-sensitive layer is comprised substantially of monodisperse Emulsion A and Emulsion B in combination,

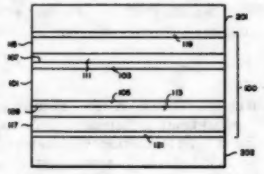
said Emulsion A being a core/shell-type silver halide emulsion whose silver halide particles each has a shell consisting substantially of silver bromide on the core thereof whose silver iodide content is not less than 6 mole %, said silver halide particles having a mean particle size of $x\mu$,

said Emulsion B being a core/shell-type silver halide emulsion whose silver halide particles each has a shell consisting substantially of silver bromide on the core thereof whose silver iodide content is not less than 5 mole % smaller than that of said core of said Emulsion A, said silver halide particles of Emulsion A having a mean particle size of $y\mu$,

wherein said x and said y have a relation of $(y/x)\times 100<70$.

4,639,411
RADIOGRAPHIC ELEMENTS EXHIBING REDUCED CROSSOVER

Richard L. Daubendiek; Robert E. Dickerson, both of Rochester, and James E. Kelly, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1986, Ser. No. 839,014
Int. Cl.[4] G03C 1/84
U.S. Cl. 430—510 8 Claims

1. A radiographic element comprised of

a support capable of transmitting blue light,

coated on each of two opposite major faces of said support, a silver halide emulsion layer capable of forming a latent image in response to exposure to blue light transmitted through the support, and

interposed between at least one of said latent image forming emulsion layers and said support a blue absorbing layer, characterized in that

said blue absorbing interposed layer is a silver iodide emulsion layer exhibiting at temperatures below 25° C. an absorption transition wavelength that is bathochromically displaced by at least 20 nm as compared to the absorption transition wavelength of β phase silver iodide.

4,639,412
RESISTIVELY HEATED PHOTOTHERMOGRAPHIC MEDIA ON VESICULAR SUBSTRATE

Gary E. LaBelle, Hugo, Minn., and David T. Ask, Somerset, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

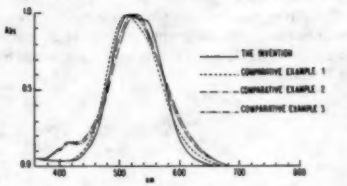
Filed Jun. 13, 1986, Ser. No. 873,817
Int. Cl.[4] G03C 1/84
U.S. Cl. 430—523 20 Claims

1. A photothermographic element comprising an opaque substrate having at least one photothermographic emulsion coated on one side of said substrate and a resistively heatable layer adhered to the other side of said substrate, said emulsion comprising silver halide in reactive association with a light-insensitive organic silver salt, a reducing agent for silver ion, and an organic film having at least 1% by volume of vesicles, at least 1% by weight of white pigment and an optical transmission density at least 1.5 to white light.

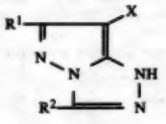
4,639,413
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS CONTAINING MAGENTA COUPLER AND HIGH BOILING POINT ORGANIC SOLVENT

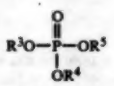
Toshio Kawagishi, and Kiyoshi Nakazyo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1985, Ser. No. 765,626
Claims priority, application Japan, Aug. 14, 1984, 59-169856
Int. Cl.[4] G03C 1/08, 7/26, 7/32
U.S. Cl. 430—546 8 Claims



1. A silver halide color photographic material comprising a support having formed thereon at least one silver halide emulsion layer having dispersed therein, in a coexisting state, at least one magenta coupler represented by formula (I) and at least one high-boiling point organic solvent represented by formula (II)


(I)


(II)

wherein R^1 and R^2 each represents a hydrogen atom or a substituent and X represents a hydrogen atom or a group capable of being released by a coupling reaction with the

oxidation product of an aromatic primary amine developing agent; and

wherein, R^3, R^4, and R^5 each represents an alkyl group, a cycloalkyl group, or an alkenyl group, and the total number of carbon atoms of the groups R^3, R^4, and R^5 is from 12 to 60, wherein the weight ratio of the high-boiling point organic solvent represented by formula (II) to the magenta coupler represented by formula (I) is from 0.05/1 to 20/1.

4,639,414

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Yukihiko Sakaguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1985, Ser. No. 744,369

Claims priority, application Japan, Jun. 13, 1984, 59-120039

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—550 **22 Claims**

1. A heat developable light-sensitive material comprising a support having thereon (1) a light-sensitive hydrophilic colloid silver halide emulsion, (2) at least one of a base and a base precursor, and (3) a hydrophilic binder, wherein the light-sensitive hyrophilic colloid silver halide emulsion is one which is chemically sensitized in the presence of a spectral sensitizing dye added after the formation of the silver halide grains but before completion of chemical sensitization.

4,639,415

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING A MAGENTA COLOR IMAGE-FORMING COUPLER

Yutaka Kaneko, Sagamihara; Toshihiko Kimura, Hino, and Kenji Kadokura, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

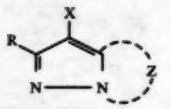
Filed Sep. 16, 1985, Ser. No. 776,442

Claims priority, application Japan, Sep. 17, 1984, 59-194494; Feb. 18, 1985, 60-31297

Int. Cl.[4] G03C *1/06, 1/08, 7/26, 7/32*

U.S. Cl. 430—558 **10 Claims**

1. A silver halide color photographic material containing a magenta color image-forming coupler represented by the following formula (I) and a compound represented by the following formula (II):



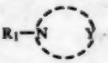
(I)

wherein

Z represents the group of nonmetallic atoms necessary for forming a nitrogen-containing heterocyclic ring, provided that the ring to be formed by said Z may have a substituent;

X represents a hydrogen atom or a substituent capable of leaving upon reaction with the oxidized product of a color developing agent; and

R represents a hydrogen atom or a substituent,



(II)

wherein R_1 is an aliphatic group, a cycloalkyl group or an aryl group; and

Y represents the group of nonmetallic atoms necessary for forming a 5- to 7-membered heterocyclic ring taken together with the nitrogen atom, provided that at least two hetero atoms among the heterocyclic ring-forming nonmetallic atoms including the nitrogen atom are not adjacent to each other.

4,639,416

INTERNAL LATENT IMAGE-TYPE SILVER HALIDE EMULSION

Tetsuo Yoshida, and Tadayoshi Kokubo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 11, 1984, Ser. No. 609,176

Claims priority, application Japan, May 12, 1983, 58-83222

Int. Cl.[4] G03C *1/28*

U.S. Cl. 430—567 **11 Claims**

1. An internal latent image silver halide emulsion containing core/shell silver halide grains with a mean grain size of about 0.4 μm or less, said grains comprising a core of chemically sensitized silver halide and a shell of silver halide covering at least the light-sensitive sites of the core, and the surface of said grains being chemically sensitized, wherein the core is chemically sensitized to such an extent that the difference between fog density F_1 and fog density F_2 as defined below is at least 0.10,

where fog density F_1 is the fog density when the internal latent image emulsion is coated in an amount (as silver) of 1.5 g/m^2 and developed with Developer D as described below at 20° C. for 13 minutes without application of imagewise exposure, not including base density;

Composition of Developer D	
N—Methyl-p-aminophenol Sulfate	2.5 g
L—Ascorbic Acid	10 g
Sodium Metaborate	35 g
Potassium Bromide	1 g
Sodium Thiosulfate	3 g
Water to make	1,000 ml

and

fog density F_2 is the fog density when the internal latent image emulsion is coated in an amount (as silver) of 1.5 g/m^2 and developed with Developer E as described below at 20° C. for 13 minutes without application of imagewise exposure, not including base density

Composition of Developer E	
N—Methyl-p-aminophenol Sulfate	2.5 g
L—Ascoribc Acid	10 g
Sodium Metaborate	35 g
Potassium Bromide	1 g
Water to make	1,000 ml

4,639,417

SILVER HALIDE X-RAY PHOTOSENSITIVE MATERIAL

Chika Honda; Akio Suzuki; Katsutoshi Machida, all of Hachioji, and Masatoshi Iwata, Akishima, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Jan. 25, 1985, Ser. No. 694,833

Claims priority, application Japan, Jan. 27, 1984, 59-13955; Jan. 30, 1984, 59-15535

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—567 **7 Claims**

1. A negative silver halide X-ray photosensitive material comprising a support bearing thereon a silver halide emulsion layer comprising at least three kinds of silver halide emulsions whose sensitivity and gradiation are substantially different from each other, wherein out of at least three kinds of said silver halide emulsions, at least one of them is a monodisperse emulsion E_1 being substantially responsible for an effective density range of from 20% up to 80% of the maximum value of effective density of a characteristic curve for the photosensitive material, at least another one of the silver halide emulsions is a polydisperse emulsion E_2 being substantially responsible for an effective density range of from 0 to 25% of the maximum value of effective density of the characteristic curve, and

at least another one of the silver halide emulsions is a low-speed emulsion.

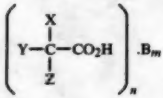
4,639,418

HEAT DEVELOPABLE PHOTOSENSITIVE MATERIAL

Yoshiharu Yabuki; Kozo Sato; Ken Kawata, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1985, Ser. No. 768,282
Claims priority, application Japan, Aug. 22, 1984, 59-173161
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—617 **10 Claims**

1. A heat developable photosensitive material comprising a support having thereon at least one light-sensitive layer comprising light-sensitive silver halide and a binder, wherein at least one layer contains a base precursor represented by the following general formula (I):



(I)

wherein at least one of X, Y and Z, which may be the same or different, represents an electron-attractive substituent selected from the group (a) consisting of a substituted sulfamoyl group, an unsubstituted sulfamoyl group, an

group and an

group, wherein R and R_2 each represents a hydrogen atoms, an alkyl group or an aryl group, and the alkyl or aryl moiety of these groups may be further substituted;

the remainder of X, Y and Z being selected from the group (b) consisting of a hydrogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, an alkynyl group, an aryl group, an aralkyl group, a silyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group and a hydroxy group, wherein the alkyl and aryl moieties may be further substituted with a substituent other than a perhaloalkyl group containing up to 3 carbon atoms;

B represents a mono-acidic or di-acidic base having a pKa value of at least 7 and containing not more than 12 carbon atoms; and

n and m each represents 1 or 2, provided that the net charge of the compound is zero.

4,639,419

IMMUNOLOGICAL COLOR CHANGE TEST INVOLVING TWO DIFFERENTLY COLORED REAGENT SPOTS

Douglas R. Olson, Chalfont, Pa.; James R. Harness, Woodbridge, and John W. Waterston, Chantilly, both of Va., assignors to Meloy Laboratories, Inc., Springfield, Va.

Continuation of Ser. No. 313,558, Oct. 22, 1981, abandoned.
This application Sep. 21, 1984, Ser. No. 653,384
Int. Cl.[4] G01N *33/546, 33/564, 33/569*
U.S. Cl. 435—5 **46 Claims**

1. A diagnostic device for detecting an antigenic material by visual color change resulting from antigenic-antibody reaction comprising:

a first reagent spot carried by a substrate and dyed to form a first color;

a second reagent spot carried by a substrate and dyed to form a second color which is visually distinct from said first reagent;

means for mixing said dyed reagent spots and a fluid specimen for for forming a a suspension having a color which is visually different than the colors of said first and second dyed reagents.

2. The diagnostic device of claim 1 wherein one of said reagents comprises an antibody carried by a substrate, said substrate selected from the group consisting of organic and inorganic agglutimalle particles.

5. The diagnostic device of claim 2, wherein said first dye absorbs light in a first part of the spectrum, said second dye absorbs light in a second part of the spectrum and a physical combination of said first dye and said second dye appears to absorb light in a third portion of the spectrum and each dye is distinguishable by the human eye.

4,639,420

METHOD FOR THE IMMUNOANALYSIS OF CHOLESTEROL EPOXIDES

Carl P. Schaffner, 10 Youngs Rd., Trenton, N.J. 08619

Filed Nov. 21, 1984, Ser. No. 673,768
Int. Cl.[4] G01N *33/53, 33/566, 33/531;* C12Q *1/60*
U.S. Cl. 435—7 **9 Claims**

1. A method for determining the presence or concentration of 5α,6α- and 5β,6β-cholesterol epoxide in a fluid containing said epoxides comprising:

contacting said fluid with a hapten in the presence of a hapten-linking reagent to convert said epoxides to ring-opened 3,5(6)-trans-diaxial-dihydroxycholestane-6(5)yl-hapten adduct;

combining said adduct with a measured amount of said adduct, said measured amount of adduct being labelled with a colorimetrically, spectrophotometrically or radioactively measurable label;

combining said adduct and measured adduct with an excess of an antibody to said adduct;

and measuring the amount of labelled adduct bound to said antibody.

4,639,421

FLUORESCENT GRAM STAIN

Burton H. Sage, Jr., Raleigh, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Oct. 1, 1984, Ser. No. 656,617
Int. Cl.[4] C12Q *1/04, 1/14, 1/10*
U.S. Cl. 435—34 **10 Claims**

1. A method for the rapid determination of the Gram sign of microorganisms in a fluid sample comprising adding a staining buffer and a fluorescent dye to a fluid sample to provide a first mixture, incubating said first mixture, additing propidium iodide to said mixture to provide a second mixture, incubating said second mixture wherein absortion of said fluorescent dye in conjunction with absorption of said propidium iodide provides fluorescently stained microorganisms, applyihg excitation energy to said second mixture, observing the color of the fluorescence emission of the stained microorganisms, and as-

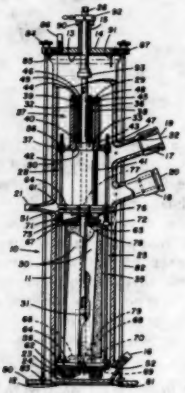
signing the positive Gram sign to microorganisms which fluoresce substantially green and the negative Gram sign to microorganisms which fluoresce substantially orange.

4,639,422

CELL CULTURE FILTER APPARATUS AND METHOD

Raymond C. Geimer, Mehlville, and William R. Tolbert, Manchester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 3, 1986, Ser. No. 825,717
Int. Cl.[4] C14M 3/02
U.S. Cl. 435—286 6 Claims



1. Continuous cell culture filter apparatus adapted for convenient manual assembly - disassembly comprising:

(A) a hollow vessel having an opening at the top,

(B) a stationary, hollow shaft means positioned within said vessel in fluid communication with said top opening of said vessel and supported downwardly therefrom without any lower bearing,

(C) a stationary filter unit supported downwardly from said shaft means without any lower bearing and without any moving seals between the filter unit or any moving filter support means which could contact the cell suspension, said filter having

(1) a fluid collection cavity in direct communication with the interior of said shaft means and the top of said vessel, and

(2) a porous outer surface having a pore size smaller than the cells to be cultured or the carrier particles upon which said cells are attached but sufficiently large to permit permeation of fluid into said fluid collection cavity,

(D) a rotatable agitator means supported downwardly from said shaft means and concentrically disposed about said filter unit for rotation by suspension from bearing means having low-friction engagement with said hollow shaft means,

(E) said shaft means having a boss section positioned between said filter unit and said bearing means and a spring seat adaptable for holding spring means positioned between said boss section and said filter unit,

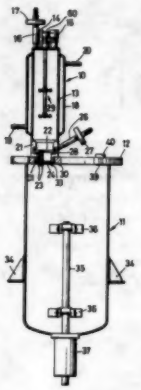
(F) said agitator means having suspended thereon a plurality of flexible vanes which are substantially equidistantly spaced apart circumferentially and which extend substantially throughout the length of said filter unit, said vanes being held between a pair of disc-like holding means at each of the upper and lower ends of the vanes and transverse to the axis of said agitator means, with the lower member of the upper pair and the upper member of the lower pair of said holding means having side slits circumferentially spaced apart to receive the widths of said vanes, and said vanes having elastomeric means at each end compressed between the corresponding pair of said holding means.

4,639,423

APPARATUS FOR THE PRODUCTION OF BIOCATALYST BEADS

Wolfgang Kahlert, Melsungen; Joachim Klein, Braunschweig; Hans-Jürgen Steinert, Ilsede, and Claus Vorlop, Braunschweig, all of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbruck, Switzerland

Filed Nov. 1, 1984, Ser. No. 667,361
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1983, 3339764
Int. Cl.[4] C12M 1/00
U.S. Cl. 435—287 14 Claims



1. In an apparatus for the production of biocatalyst beads which includes:

an immobilization vessel which has an upper region and a lower region, said immobilization vessel being sealed in a germproof manner;

at least one nozzle means for filling said immobilization vessel, said nozzle means being associated with said immobilizaton vessel upper region;

discharge means associated with said immobilization vessel lower region, said discharge means comprising a pressure chamber defined by a top member and a bottom member, with said bottom member being provided with a plurality of discharge openings, a plurality of discharge pipes, each discharge pipe penetrating the top member for communication with the interior of the immobilization chamber and coaxially passing through one of said discharge openings in said bottom member;

a collecting vessel for containing a solution of a cross-linking agent or a reprecipitation bath, said collecting vessel having an upper region arranged beneath the lower region of said immobilization vessel;

the improvement comprising:

a connecting nozzle surrounding all of said discharge pipes and forming part of the lower region of said immobilization vessel;

said collecting vessel being sealed in a germproof manner;

means located in the upper region of said collecting vessel receiving said connecting nozzle whereby the interior of said immobilization vessel and the interior of said collecting vessel are in communication via said discharge pipes; and

means providing a germproof seal between said connecting nozzle and said means receiving said connecting nozzle.

4,639,424

DETERMINATION OF ALKALI METALS

Sie-Ting Wong, Mundelein, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 544,172, Oct. 21, 1983, abandoned. This application Jul. 27, 1984, Ser. No. 634,946

Int. Cl.[4] G01N *1/18, 21/75, 33/20, 33/50*

U.S. Cl. 436—74 2 Claims

1. A method for determining the alkali metal content of a protein-containing liquid which has not been treated to remove proteins, which method comprises the steps of:

(a) contacting the protein-containing liquid containing an alkali metal cation with (1) a monocyclic crown ether capable of forming a complex with the alkali metal cation, (2) a solvent selected from the group consisting of diphenyl ether, p-chlorobenzotrifluoride, 3,4-dichlorobenzotrifluoride, 1,2,4-trichlorobenzene, trichlorotrifluoroethane and mixtures thereof, and (3) an anionic dye to form a reaction mixture having an aqueous phase and a phase containing said solvent;

(b) separating from the mixture of step (a) the solvent phase, said phase containing said solvent containing a complex of the alkali metal cation, the crown ether and the anionic dye; and

(c) determining the concentration of the dye in the solvent phase as a measure of the alkali metal content of the protein-containing liquid.

4,639,425

HETEROGENEOUS IMMUNOASSAY AND REAGENT THEREFORE

Manfred Baier, Pocking-Possenhofen, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 17, 1984, Ser. No. 631,816

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327642

Int. Cl.[4] G01N *33/543, 33/544, 33/545, 33/546*

U.S. Cl. 436—518 7 Claims

1. In a heterogeneous immunoassay for the determination of a partner of an immune reaction in a blood serum or plasma sample in which one of the reaction partners is adsorbed on a solid carrier, the improvement comprising adding a detergent in such an amount to the incubation medium of the immune reaction between the soluble partner or partners and the partner adsorbed on the solid carrier that its concentration is from 0.0001 to 0.01% (w/v).

4,639,426

DECORATIVE HARD GOLDEN CERAMIC ARTICLE

Yoshio Nagato, Kokubu, and Kazunori Soroi, Sendai, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 535,739, Sep. 26, 1983, Pat. No. 4,511,665. This application Mar. 18, 1985, Ser. No. 712,424

Claims priority, application Japan, Sep. 30, 1982, 57-173769

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] C04B *35/48, 35/58*

U.S. Cl. 501—96 7 Claims

1. A method for making a decorative hard golden ceramic article comprising the steps of:

(a) forming a powdered mixture consisting essentially of at least one member selected from titanium nitride and zirconium nitride as the main component, and 5% to 30% by weight of zirconia (ZrO_2);

(b) compression molding said mixture into a desired shape in a mold prior to sintering; and

(c) sintering the molded mixture in a non-oxidizing atmosphere after said molded mixture is removed from said mold.

4. A method for making a decorative hard golden ceramic article comprising the steps of:

(a) forming a powdered mixture consisting essentially of at least one member selected from titanium nitride and zirconium nitride as the main component, and 0.1% to 30% by weight of a second member selected from the group consisting of zirconia (ZrO_2), alumina (Al_2O_3) and mixtures thereof;

(b) compression molding said mixture into a desired shape in a mold prior to sintering; and

(c) sintering the molded mixture in a non-oxidizing atmosphere after said molded mixture is removed from said mold.

4,639,427

STRESS-CORROSION RESISTANT PROPPANT FOR OIL AND GAS WELLS

Arup K. Khaund, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

Filed Jun. 28, 1985, Ser. No. 750,714

Int. Cl.[4] C04B *35/10*

U.S. Cl. 501—128 3 Claims

1. In a proppant medium composed of spherical particles of a sintered composition of alumina, silica, and the impurities associated with bauxite, such impurities selected from the group consisting of alkali and alkaline earth, oxides, iron oxide, and titanium oxide, the improvement wherein there is at least 15% silica in the composition and zirconium oxide is present in the ratio of between one part of zirconia per twenty parts of silica to one part of zirconia per six parts of silica by weight, the proppant spheres as fired, consisting essentially of mullite, alumina, and glass, the silica content in the weight ratio being calculated as SiO_2 combined in the mullite phase and SiO_2 in the glass phase, and zironia content calculated as ZrO_2 and present in the glass phase.

4,639,428

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 6, 1984, Ser. No. 638,319

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—115 36 Claims

1. A transition metal containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent sequentially with (A) an organometallic compound of a Group IIa, IIb or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon group, (B) an oxygen containing compound selected from ketones, aldehydes, alcohols or mixtures thereof, (C) an acyl halide, (D) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal, (E) a Group IIIa metal hydrocarbyl dihalide and (F) Cl_2, Br_2, an interhalogen or mixtures thereof with the proviso that the inert solid support material can alternatively be treated with (i) the (A) organometallic compound and the (B) oxygen containing compound simultaneously, (ii) the reaction product of the (A) organometallic compound and (B) oxygen containing compound or (iii) the (B) oxygen containing compound followed by treating with the (A) organometallic compound.

4,639,429

CATALYST FOR THE METATHESIS OF OLEFINS

Jean M. M. Basset; Michel Leconte, both of Villeurbanne; Jean Ollivier, Arudy, and Francoise Quignard, Lyons, all of France, assignors to Societe Nationale Elf Aquitaine, France

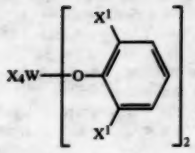
Division of Ser. No. 621,041, Jun. 15, 1984, Pat. No. 4,550,216. This application Jul. 18, 1985, Ser. No. 756,457

Claims priority, application France, Jun. 15, 1983, 83 09876; Jun. 8, 1984, 84 09001

Int. Cl.[4] B01J *31/12, 31/14*

U.S. Cl. 502—117 12 Claims

1. A di(2,6-dihalophenoxy)tungsten tetrahalide of the formula



wherein X and X' are halogen.

5. A catalyst for the metathesis of olefins comprising the combination of an organoaluminum, organotin or organolead compound and the tungsten tetrahalide of claim 1.

4,639,430

CATALYST SUPPORT, PROCESS FOR ITS MANUFACTURE, AND CATALYSTS PREPARED WITH THIS SUPPORT

Veronique Pasquet, Lyons, and Roger Spitz, Serezin, both of France, assignors to Atochem, France

Filed May 22, 1986, Ser. No. 866,139

Claims priority, application France, Jun. 14, 1985, 85 09090

Int. Cl.[4] C08F 4/62, 4/64, 4/68

U.S. Cl. 502—120 **9 Claims**

1. A catalyst support consisting essentially of a mixture of silica and a magnesium chloride, said support having a porous texture and containing less than 100 micromoles of hydroxyl groups per gram of support.

7. A catalyst for the polymerization of an alphaolefin consisting essentially of a catalyst support of claim 1 or 2 and at least one active component selected from a halide of a transition metal of Group IV, V or VI of the Periodic Table.

4,639,431

CATALYSTS IN FISCHER-TROPSCH PROCESS FOR PRODUCING OLEFINS

William E. Gates, Somerset, and Rocco A. Fiato, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 11, 1985, Ser. No. 754,003

Int. Cl.[4] B01J 23/10, 23/78, 23/80

U.S. Cl. 502—304 **12 Claims**

1. A hydrocarbon synthesis catalyst comprising a sintered combination of metal oxides having the following components:

(a) an oxide of a Group VIII metal;

(b) an oxide of a Group IIB metal;

(c) an oxide of a Group IA alkali metal; and,

(d) an oxide of a lanthanide metal,

such that said sintered combination comprises a series of the Group VIII metal and the Group IIB metal spinels and the alkali metal oxide dispersed in a lanthanide metal oxide matrix.

4,639,432

OXIDATION CATALYSTS

Andrew Holt, Enfield; Martin G. Cheek, Cheshunt, and Ernest N. Clegg, Ware, all of England, assignors to UOP Limited, Middlesex, England

Filed Oct. 18, 1983, Ser. No. 543,001

Claims priority, application United Kingdom, Oct. 18, 1982, 8229655

Int. Cl.[4] B01J 23/10, 23/64, 23/66, 23/89

U.S. Cl. 502—324 **7 Claims**

1. A catalyst for catalyzing the oxidation, in the presence of oxygen, of carbon monoxide to carbon dioxide, said catalyst being substantially chloride-free and consisting essentially of stannic oxide supporting a mixture of (i) palladium, (ii) at least one member of the group consisting of platinum, ruthenium, rhodium and iridium and (iii) at least one metal selected from the group consisting of copper, nickel, cobalt, iron, manganese, silver, lanthanum, cerium, praseodymium and neodymium, said catalyst being suitable for use at ambient or sub-ambient temperature and being characterized by enhanced activity for said oxidation and reduced proneness to deactivation in service by the incorporation therein of (ii) and (iii).

4,639,433

GLYCOPEPTIDE DERIVATIVES

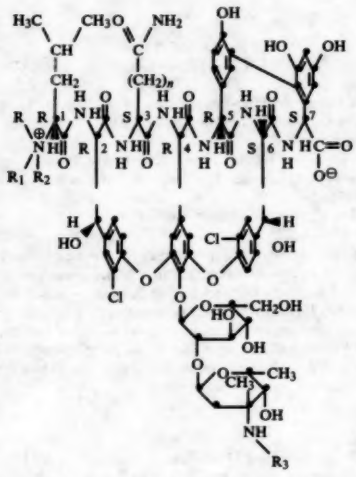
Ann H. Hunt, Greenwood; R. Michael Molloy, Danville; Ramakrishnan Nagarajan, and Amelia A. Schabel, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 14, 1985, Ser. No. 765,430

Int. Cl.[4] A61K 37/00; C07K 9/00

U.S. Cl. 514—8 **29 Claims**

1. compound of the formula:



wherein

R and R_1 are hydrogen or methyl;

R_2 is methyl or R_3;

R_3 is hydrogen, C_4–C_{24}-alkanoyl, C_4–C_{24}-alkenoyl or a C_4–C_{24}-alkanoyl or C_4–C_{24}-alkenoyl group which has one or more halo, C_1–C_8-alkoxy, C_1–C_8-alkylthio, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkanoyl, carboxy, hydroxy, or

substituents;

R_4 and R_5 are independently hydrogen or C_1–C_4-alkyl, or R_4 is hydrogen and R_5 is an amino-protecting group; and

n is 1 or 2;

provided that: (1) at least one of R_2 and R_3 must be other than hydrogen; and (2) when n is 2, R and R_1 must be hydrogen; and the salts of these compounds.

4,639,434
NOVEL CYCLOSPORINS

Roland Wenger, Rieben; René P. Traber; Hans Kobel, both of Basel, and Hans Hofmann, Ettingen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Mar. 19, 1985, Ser. No. 713,429

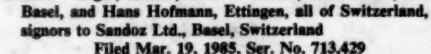
Claims priority, application United Kingdom, Mar. 23, 1984, 8407618; May 10, 1984, 8411922

Int. Cl.[4] A61K *37/64;* **C07K** *5/12*

U.S. Cl. 514—11 **6 Claims**

1. A cyclosporin of formula IIIa,

(IIIa)



wherein

Y' is -αAbu-, -Thr-, -Val- or -Nva-,

Z' is -Val-, when Y' is -Thr-, or -Val- or

Z' is -Val- or -Nva-, when Y' is -αAbu- or -Nva-,

W' is -(D)Ser-,

when Y' is -Thr-, -Val- or -Nva- and Z' is -Val-, or

when Y' is -αAbu- or -Nva- and Z' is -Nva- or

W' is -(D)Thr-, when Y' is -αAbu- and Z is -Val-, and

X' is -MeBmt- or

X' is -dihydro -MeBmt-, when Y' is -Thr-, -Val-, or -Nva-,

Z' is -Val- and

W' is -(D)Ser-.

4,639,435
PHARMACEUTICAL COMPOSITION SUITABLE FOR INTESTINAL ADMINISTRATION

Setsuro Fujii, Toyonaka; Touru Yokoyama, Tokyo; Kouji Ikegaya, Higashi-Murayama; Nobuo Yokoo, and Masahiko Nagakura, both of Sayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Jun. 27, 1984, Ser. No. 625,231

Claims priority, application Japan, Jun. 29, 1983, 58-116089

Int. Cl.[4] A61K *37/30, 37/558*

U.S. Cl. 514—11 **3 Claims**

1. A pharmaceutical composition suitable for intestinal absorption, comprising (i) a physiologically active substance which is at least one member selected from the group consisting of kallikrein and calcitonin, and (ii) 1-isopropyl-4-[4-(1,2,3,4-tetrahydronaphthoyloxy)-benzoyl] piperazine methanesulfonate.

4,639,436
ANTIDIABETIC 3,4,5-TRIHYDROXYPIPERIDINES

Bodo Junge; Hans P. Krause; Lutz Müller, and Walter Puls, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

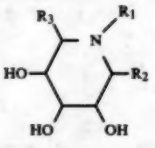
Filed Aug. 23, 1978, Ser. No. 936,280

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1977, 27387173; Dec. 24, 1977, 27580252

Int. Cl.[4] A61K *31/70;* **C07D** *211/46*

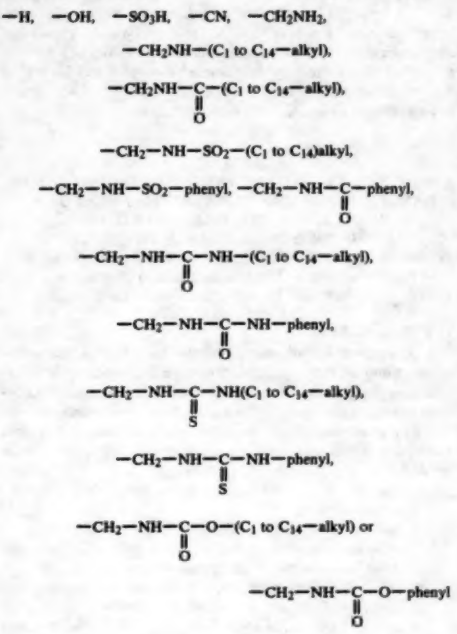
U.S. Cl. 514—24 **32 Claims**

1. A compound of the formula



I

in which R_1 is C_5–C_{30} alkyl, C_2–C_{18} alkenyl, C_2–C_{18} alkinyl, C_3–C_8 cycloalkyl, C_3–C_8 cycloalkenyl, C_3–C_8-cycloalkinyl, phenyl (a), C_1–C_2 and C_7–C_{30} alkyl substituted by phenyl (b) or substituted C_1–C_4-alkyl said C_5–C_{30} alkyl, cycloalkyl, cycloalkenyl and cycloalkinyl being unsubstituted or substituted by hydroxy, C_1–C_4-alkoxy, acyloxy, amino, mono- C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, acylamino, mercapto, C_1–C_4 alkylthio, halogen, C_1–C_4 alkylcarbonyl, carboxyl nitro, cyano, formyl, sulfo, a heterocyclic radical derived from a hexose or pentose, attached to the alkyl moiety directly via a ring atom or via an —O—, —S— or —NH-bridge or naphthyl said phenyl (a) being unsubstituted or substituted by C_1 to C_{10} alkyl, C_1 to C_{10} chloroalkyl, C_1 to C_{10} nitroalkyl, C_1 to C_{10} cyanoalkyl, C_1 to C_{10} alkenyl, hydroxyl, C_1 to C_4 alkoxy, amino, mono-C_1 to C_4 alkylamino, di-C_1–C_4 alkylamino, mercapto, C_1–C_4 alkylthio, carboxyl, C_1–C_4 carbalkoxy, sulfo, C_1–C_4 alkylsulfonyl, phenylsulfonyl, aminosulfonyl, C_1–C_4 alkylaminosulfonyl, di-C_1–C_4 alkylaminosulfonyl, nitro, cyano, formyl, C_1–C_4 alkylcarbonylamino, C_1–C_4 alkylcarbonyl, benzoyl, benzylcarbonyl or phenylethylcarbonyl; said substituted C_1–C_4 alkyl being substituted by hydroxy, C_1–C_4-alkoxy, acyloxy, amino, mono- C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, acylamino, mercapto, C_1–C_4 alkylthio, halogen, C_1–C_4 alkylcarbonyl, carboxyl nitro, cyano, formyl, sulfo, a heterocyclic radical derived from a hexose or pentose, attached to the alkyl moiety directly via a ring atom or via an —O—, —S— or —NH—bridge or naphthyl, said acyl being derived from an aliphatic carboxylic acid having from 1 to 7 C-atoms, a phenyl carboxylic acid, unsubstituted or substituted by carboxy, hydroxy, halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, nitro or amino, or a 5- or 6-membered aromatic heterocyclic carboxylic acid containing from 1 to 3 hetero-atoms each of which is N, O or S, unsubstituted or substituted by C_1 to C_4 alkyl, chlorine, bromine or amino; said naphthyl and phenyl (b) being unsubstituted or substituted by hydroxyl, amino, C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, C_1–C_4alkoxy, nitro, cyano, carboxy, C_1–C_4 alkoxycarbonyl, C_1–C_6 alkyl, halogen, C_1–C_4 alkylthio, mercapto, C_1–C_4 alkylsulfonyl, sulfo, aminosulfonyl or C_1–C_4 alkylaminosulfonyl R_2 is



wherein phenyl is unsubstituted or substituted by methyl, ethyl, methoxy, chlorine, bromine or nitro, R_3 is —H, —CH_3,

—CH_2OH, —CH_2—NH_2, NHR'—CH_2—, NR'R"—CH_2—, R'CONH—CH_2, R'CO—NR"CH_2—, R'O—CH_2, R'$COOCH_2$—, R'SO_2NHCH_2—, R'SO_2—NR"CH_2—, R'NH—CO—NH—CH_2—, R'NHCS—NH—CH_2, R'O—CO—NH—CH_2—, wherein R' and R" are the same or different and each has the meaning hydrogen or C_1–C_{30} alkyl, C_2–C_{18} alkenyl, C_2–C_{18} alkinyl, C_3–C_8 cycloalkyl, C_3–C_8 cycloalkenyl, C_3–C_8-cycloalkinyl or phenyl (a), said alkyl, cycloalkyl, cycloalkenyl and cycloalkinyl being unsubstituted or substituted by hydroxy, C_1–C_4-alkoxy, acyloxy, amino, mono- C_1–C_4alkylamino, di-C_1–C_4 alkylamino, acylamino, mercapto, C_1–C_4 alkylthio, halogen, C_1–C_4 alkylcarbonyl, carboxyl, nitro, cyano, formyl, sulfo, a heterocyclic radical derived from a hexose or pentose, attached to the alkyl moiety directly via a ring atom or via an —O—, —S— or —NH— bridge, naphthyl or phenyl (b) said acyl being derived from an aliphatic carboxylic acid having from 1 to 7 C-atoms, a phenyl carboxylic acid, unsubstituted or substituted by carboxy, hydroxy, halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, nitro or amino, or a 5- or 6-membered aromatic heterocyclic carboxylic acid containing from 1 to 3 hetero-atoms each of which is N, O or S, unsubstituted or substituted by C_1 to C_4 alkyl, chlorine, bromine or amino; said phenyl (a) being unsubstituted or substituted by C_1 to C_{10} alkyl, C_1 to C_{10} chloroalkyl, C_1 to C_{10} nitroalkyl, C_1 to C_{10} cyanoalkyl, C_1 to C_{10} alkenyl, hydroxyl, C_1 to C_4 alkoxy, amino, mono-C_1 to C_4 alkylamino, di-C_1–C_4alkylamino, mercapto, C_1–C_4alkylthio, carboxyl, C_1–C_4-carbaloxy, sulfo, C_1–C_4alkylsulfonyl, phenylsulfonyl, aminosulfonyl, C_1–C_4 alkylaminosulfonyl, di-C_1–C_4alkylaminosulfonyl, nitro, cyano, formyl, C_1–C_4 alkylcarbonylamino, C_1–C_4 alkylcarbonyl, benzoyl, benzylcarbonyl or phenylethylcarbonyl; said napthyl and phenyl (b) being unsubstituted or substituted by hydroxyl, amino, C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, C_1–C_4alkoxy, nitro, cyano, carboxy, C_1–C_4 alkoxycarbonyl, C_1–C_6 alkyl, halogen, C_1–C_4 alkylthio, mercapto, C_1–C_4 alkylsulfonyl, sulfo, aminosulfonyl or C_1–C_4 alkylaminosulfonyl.

27. A method of combating adiposity, diabetes and/or hyperlipaemia in warm-blooded animals which comprises administering to the said animal an effective amount for the treatment of diabetes, hyperlipaemia or adiposity of an active compound according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

4,639,437

KIT OR DEVICE AND METHOD FOR ADMINISTERING GANGLIOSIDES AND DERIVATIVES THEREOF BY INHALATION AND PHARMACEUTICAL COMPOSITIONS SUITABLE THEREFOR

Francesco della Valle, Padova, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia, S.p.A., Abano Terme, Italy

Filed Apr. 12, 1984, Ser. No. 599,340

Int. Cl.⁴ A61K *31/70*

U.S. Cl. 514—54 **10 Claims**

1. A method for stimulating nerve sprouting which comprises administering by inhalation an effective amount of at least one ganglioside compound or a pharmaceutically acceptable salt thereof, or at least one inner ester ganglioside derivative or a pharmaceutically acceptable salt thereof, or mixtures thereof, wherein said inner ester ganglioside derivative comprises:

(a) a carbohydrate portion, at least one ceramide and at least one acid moiety;

(b) said carbohydrate portion including at least one N-acetylgalactosamine or N-acetylglucosamine moiety and at least one glucose or galactose moiety;

(c) said acid moiety including at least one N-acetylneuraminic acid or N-glycolylneuraminic acid; and

(d) the carboxyl group of at least one of said acid moieties being ester bonded to a hydroxyl group of one of said carbohydrates or one of said acid moieties to form a lactonic ring.

4,639,438

O,S-DIALKYL-O-(SUBSTITUTED PHENYL)-THIOLPHOSPHATES AS PESTICIDES

Richard Sehring; Wolfgang Buck, both of Ingelheim; Ricarda Prokic-Immel, Mainz, and Sigmund Lust, Darmstadt, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Fed. Rep. of Germany

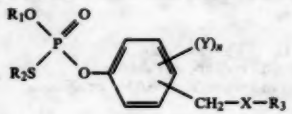
Continuation of Ser. No. 678,224, Dec. 5, 1984, abandoned, which is a continuation of Ser. No. 503,675, Jun. 13, 1983, abandoned. This application Mar. 12, 1986, Ser. No. 839,036

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 3223949

Int. Cl.⁴ A01N *57/14*; C07F *9/18*

U.S. Cl. 514—129 **6 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are each independently straight or branched alkyl of 1 to 3 carbon atoms;

R_3 is alkyl of 1 to 8 carbon atoms;

X is oxygen;

Y is chlorine, bromine or fluorine; and

n is 1 or 2.

2. The method of killing pests, which comprises contacting said pests with an effective pesticidal amount of a compound of claim 1.

4,639,439

CONTRACEPTIVE COMPOSITION

Peter W. Howie, Monifieth, and Alan McNeilly, Galashiels, both of England, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile de France, Paris, France

Filed Oct. 10, 1985, Ser. No. 786,328

Claims priority, application European Pat. Off., Oct. 10, 1984, 84402033.9

Int. Cl.⁴ A61K *31/56*

U.S. Cl. 514—171 **10 Claims**

1. A pharmaceutical composition for suppressing fertility comprising a prolactin elevating benzamide, a progestogen and a pharmaceutically acceptable carrier.

4,639,440

THERAPEUTIC USE OF CYPROTERONE ACETATE

Manlio Blandamura, Rome, Italy, assignor to Finchimica S.R.L., Milan, Italy

Filed Sep. 24, 1985, Ser. No. 779,421

Claims priority, application Italy, Jan. 8, 1985, 19041 A/85

Int. Cl.⁴ A61K *31/56*

U.S. Cl. 514—178 **4 Claims**

1. A method of treating functional and tumoral estrogen-dependent pathology caused by intrafollicular iperestrogenism, which comprises:

administering to a subject a therapeutically effective amount of cyproterone acetate which blocks the estrogen signal in said subject.

4,639,441

2-PENEM-3-CARBOXYLIC ACID DERIVATIVES AND USE

Tetsuo Miyadera; Yukio Sugimura; Teruo Tanaka; Toshihiko Hashimoto; Kimio Iino, and Shinichi Sugawara, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

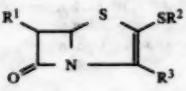
Continuation of Ser. No. 241,737, Mar. 9, 1981. This application Feb. 24, 1984, Ser. No. 582,152

Claims priority, application Japan, Mar. 10, 1980, 55-30013; Mar. 17, 1980, 55-33529; Jun. 3, 1980, 55-74761

Int. Cl.[4] C07D *499/00*; A61K *31/425*

U.S. Cl. 514—195 **28 Claims**

1. Compounds of formula (I)



(I)

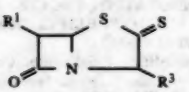
wherein

R^1 represents hydrogen, lower alkyl, lower alkoxy, a group of the formula R^4A— in which R^4 represents a hydroxy group, an alkoxy-group having from 1 to 3 carbon atoms in the alkyl moiety, an aliphatic acyloxy group having from 2 to 4 carbon atoms in the aliphatic moiety, a benzyloxycarbonyloxy group, a p-nitrobenzyloxycarbonyloxy group, an alkylsulfonyloxy group having from 1 to 3 carbon atoms, a benzenesulfonyloxy group, a p-toluenesulfonyloxy group, a trimethylsilyloxy group or a t-butyldimethylsilyloxy group; and A represents an ethylidene group;

R^2 represents a hydrogen atom; and

R^3 represents a carboxy group or a protected carboxy group; and

the tautomers of said compounds of the formula Ia



(Ia)

and pharmaceutically acceptable salts thereof.

4,639,442

BENZOCYCLOBUTENE AMINOALKYLENE ETHERS AND THIOETHERS, PHARMACEUTICAL COMPOSITIONS AND USE

Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale, and William L. Studt, Harleysville, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

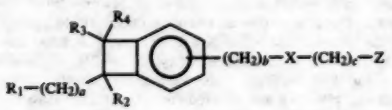
PCT No. PCT/US85/00789, § 371 Date Nov. 1, 1985, § 102(e) Date Nov. 1, 1985, PCT Pub. No. WO85/05032, PCT Pub. Date Nov. 21, 1985

Continuation-in-part of Ser. No. 664,222, Oct. 23, 1984, which is a continuation-in-part of Ser. No. 604,813, Apr. 27, 1984, which is a continuation-in-part of Ser. No. 489,702, Apr. 29, 1983, Pat. No. 4,529,723. This PCT application Apr. 29, 1985, Ser. No. 798,697

Int. Cl.[4] A61K *31/41, 31/445*; C07D *249/14, 401/12*

U.S. Cl. 514—212 **22 Claims**

1. A compound of the formula



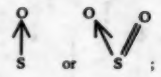
wherein:

a is 1 or 2;

b is 0 or 1;

c is 2, 3 or 4;

X is oxygen, sulfur,



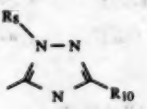
Z is —NHR_7;

R_1 is —NR_5R_6;

R_2, R_3 and R_4 are each independently hydrogen, lower alkyl, allyl, arylloweralkyl, loweralkoxycarbonyl or lower alkyl substituted by hydroxy, loweralkoxycarbonyl or NR_5R_6;

R_5 and R_6 are each independently H or alkyl, or both together with the nitrogen to which they are attached form a 5, 6 or 7-membered ring which may include one to three additional hetero atoms of N, O or S;

R_7 is selected from the group consisting of

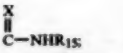


R_8 is H or lower alkyl;

R_{10} is hydrogen, lower alkyl, lower alkenyl, aryl, arloweralkyl, hydroxyloweralkyl, acyloxyloweralkyl, loweralkoxyloweralkyl, aryloxyalkyl, aroyloxyalkyl, aralkyloxyalkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, hydroxy, alkoxy, alkylthio, halogen or $NR_{11}R_{12}$, where:

R_{11} is hydrogen, lower alkyl, lower alkenyl or arloweralkyl; and

R_{12} is hydrogen, COR_{13}, SO_2R_{14} or



R_{13} is hydrogen, lower alkyl, aryl, arloweralkyl, loweralkoxy, heteroaryl, or monocyclic heteroarylalkyl;

R_{14} is loweralkyl or aryl;

R_{15} is hydrogen, lower alkyl, cycloloweralkyl, aryl or lower aralkyl;

wherein the term aryl is phenyl or substituted phenyl or a pharmaceutically acceptable salt thereof.

19. A method for decreasing acid secretion in the gastrointestinal tract of mammals by administering thereto an antisecretory effective amount of a compound according to claim 1.

4,639,443

LABDANE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND USE

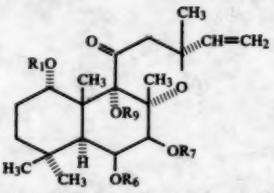
Raymond W. Kosley, Jr., Bridgewater, and Robert J. Cherill, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 707,283, Mar. 1, 1985. This application Apr. 4, 1986, Ser. No. 848,053

Int. Cl.[4] A61K *31/35, 31/535*; C07D *319/04, 413/06*

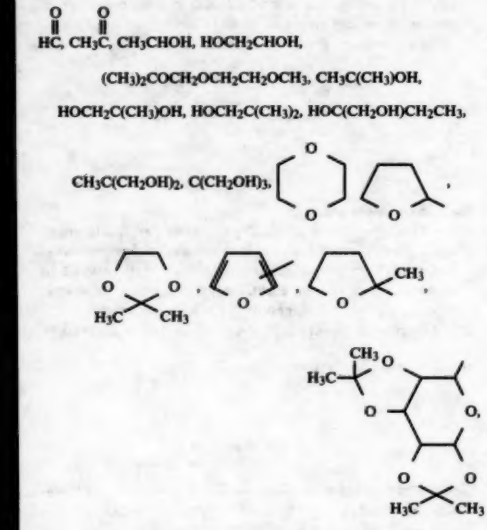
U.S. Cl. 514—222 **9 Claims**

1. A compound of the formula



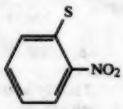
wherein:

(a) R_6 and R_7 are each independently hydrogen, a group of the formula R_8CO wherein R_8 is hydrogen, loweralkyl,

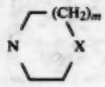


a group of the formula $R_{10}OCR_{31}R_{32}(CH_2)_nR_{11}$ wherein R_{10} is hydrogen or loweralkyl, R_{31} is hydrogen or loweralkyl, R_{32} is hydrogen or loweralkyl, and n is 0, 1, 2, or 3, a group of the formula $R_{11}R_{12}NCHR_{13}$ wherein R_{11} is hydrogen, loweralkyl, a group of the formula

a group of the formula

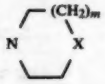


or a group of the formula $R_{14}CO$ wherein R_{14} is hydrogen or loweralkyl; R_{12} is hydrogen or loweralkyl; R_{13} is hydrogen, loweralkyl, benzyl or a group of the formula CH_2OH; R_{11} and R_{12} taken together with the nitrogen atom to which they are attached form a group of the formula



wherein X is O, S or a group of the formula CHR_{15} wherein R_{15} is hydrogen, loweralkyl or a group of the formula OR_{16} wherein R_{16} is hydrogen, loweralkyl or a group of the formula COR_{17} wherein R_{17} is loweralkyl, and m is 0 or 1; a group of the formula NR_{18} wherein R_{18} is loweralkyl;

(b) R_1 and R_9 taken together form a group of the formula $CHNR_{19}R_{20}$ wherein R_{19} and R_{20} are each independently loweralkyl; and R_{19} and R_{20} taken together with the nitrogen atom to which they are attached form a group of the formula



wherein X and m are as hereinbeforedescribed;

the optical and geometric isomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

9. An intraocular pressure reducing composition comprising an inert intraocular pressure reducing adjuvant and as the active ingredient, an intraocular pressure reducing effective amount of a compound or a pharmaceutically acceptable acid addition salt thereof according to claim 1.

4,639,444

3,5-DIALKYL-4,6-DIARYL-TETRAHYDRO-2H-13,5-THIADIAZINE-2-THIONE DERIVATIVE, PROCESS FOR ITS PRODUCTION AND ANTIHYPERLIPIDEMIC AGENT CONTAINING IT

Yoshihiro Fujikawa, Funabashi; Mitsuaki Sakashita, Urawa, and Nobutomo Tsuruzoe, Kuki, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

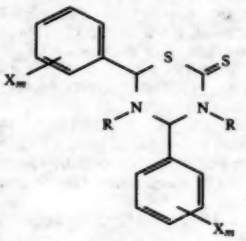
Filed Nov. 20, 1985, Ser. No. 800,025

Claims priority, application Japan, Nov. 30, 1984, 59-254921

Int. Cl.[4] C07D *285/34, 407/10*; **A61K** *31/54*

U.S. Cl. 514—222 **31 Claims**

1. A compound of the formula:



(I)

wherein R is methyl or ethyl, m is 1, 2 or 3, X is independently selected from hydrogen, a lower alkyl, lower alkoxy, lower alkylthio, fluorine, bromine, phenoxy or substituted phenoxy, with the proviso that when X is hydrogen, R is ethyl and 2X taken together is methylenedioxy or —CH=CH—CH=CH—, and with the further proviso that the substituents on the substituted phenoxy are selected from the group consisting of a lower alkyl, lower alkoxy, lower alkylthio, fluorine and bromine.

10. A pharmaceutical composition for raising the ratio of

high density lipoprotein chlesterol to total cholesterol in serum, comprising a ratio raising effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

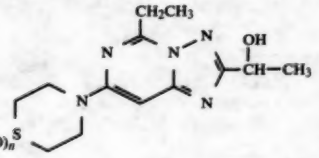
4,639,445

METABOLITES OF TRIAZOLO[1,5-C]PYRIMIDINES

Roy L. McQuinn, White Bear, and James J. Wade, Oakdale, both of Minn., assignors to Riker Laboratories, St. Paul, Minn.

Filed Oct. 25, 1985, Ser. No. 791,594
Int. Cl.[4] C07D *417/04*; A61K *31/54*
U.S. Cl. 514—222 **7 Claims**

1. A compound of the formula:



wherein n is 1 or 2; said compound being levorotatory; or a pharmaceutically acceptable acid-addition salt thereof.

6. A method for obtaining bronchodilation in a mammal, comprising administering a compound according to claim 1 to said mammal in an amount effective to obtain bronchodilation.

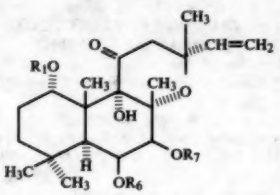
4,639,446

AMINOACYLLABDANES, PHARMACEUTICAL COMPOSITIONS AND USE

Raymond W. Kosley, Jr., Bridgewater, and Robert J. Cherill, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 681,779, Dec. 14, 1984. This application Dec. 4, 1985, Ser. No. 804,405
Int. Cl.[4] A61K *31/35, 31/535*; C07D *311/92, 413/12*
U.S. Cl. 514—222 **28 Claims**

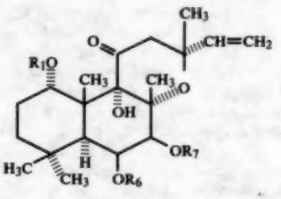
1. A compound of the formula



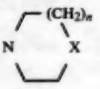
wherein R_1 is $R_2R_3NCHR_4CO$ wherein R_2 is hydrogen, loweralkyl or benzyl, R_3 is hydrogen or loweralkyl and R_4 is hydrogen, loweralkyl or benzyl; R_2 and R_3 taken together with the nitrogen atom to which they are attached form a group of the formula

wherein X is CO, O, S, SO, SO_2; a group of the formula CHR_9 wherein R_9 is hydrogen, loweralkyl or a group of the formula OR_{10} wherein R_{10} is hydrogen or COR_{11} wherein R_{11} is loweralkyl; or a group of the formula NR_{12} wherein R_{12} is loweralkyl; n is 1 or 0; R_6 is hydrogen or a group of the formula R_5CO wherein R_5 is hydrogen or loweralkyl; R_7 is hydrogen or a group of the formula R_8CO wherein R_8 is hydrogen or loweralkyl; the optical and geometric isomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

23. An intraocular pressure reducing composition comprising an inert adjuvant and as the active ingredient, an amount effective in reducing intraocular pressure of a compound of the formula



wherein R_1 is $R_2R_3NCHR_4CO$ wherein R_2 is hydrogen, loweralkyl or benzyl, R_3 is hydrogen or loweralkyl and R_4 is hydrogen, loweralkyl or benzyl; R_2 and R_3 taken together with the nitrogen atom to which they are attached form a group of the formula



wherein X is CO, O, S, SO, SO_2, a group of the formula CHR_9 wherein R_9 is hydrogen, loweralkyl or a group of the formula OR_{10} wherein R_{10} is hydrogen or COR_{11} wherein R_{11} is loweralkyl, or a group of the formula NR_{12} wherein R_{12} is loweralkyl; n is 0 or 1; R_6 is hydrogen or a group of the formula R_5CO wherein R_5 hydrogen or loweralkyl; R_7 as hydrogen or a group of the formula R_8CO wherein R_8 is hydrogen or loweralkyl; the optical and geometric isomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

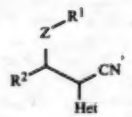
4,639,447

AZOLYLNITRILES, AND FUNGICIDES CONTAINING THESE COMPOUNDS

Karl Roeser, Hirschberg; Manfred Lauer, Ludwigshafen; Hubert Sauter, Mannheim; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 4, 1985, Ser. No. 741,112
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421179
Int. Cl.[4] A01N *43/50, 43/653*; C07D *233/61, 249/08*
U.S. Cl. 514—222 **4 Claims**

1. A compound of the formula

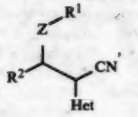


(I)

where R^2 is a 5-membered or 6-membered unsaturated heterocyclic structure possessing one or two hetero atoms or is phenyl which is unsubstituted or substituted by R_n, R is hydrogen, alkyl, alkoxy, alkylthio, alkylsulfonyl, halogen, haloalkyl, nitro, cyano, unsubstituted or halogen, cyano, nitro or halo-C_1–C_2-alkyl substituted phenyl, unsubstituted or halogen, cyano, nitro or halo-C_1–C_2-alkyl substituted phenoxy or unsubstituted or C_1–C_4-alkyl substituted amino, R^1 is C_1–C_{10}-alkyl, C_3–C_8-cycloalkyl, C_4–C_{11}-cycloalkyl-alkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy,

C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aryl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aralkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aryloxyalkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted benzyloxyalkyl, C_2–C_4-alkenyl, propargyl, butynyl or $(CH_2—CH_2O)_m—R^4$, where R^4 is C_1–C_4-alkyl, unsubstituted or chloro-substituted aryl or unsubstituted or chloro-substituted benzyl and m is 1, 2, 3 or 4, Het is 1,2,4-triazol-1-yl or imidazol-1-yl, n is 1, 2, 3, 4 or 5, Z is oxygen, SO_t or, (R^3N) where t is 0, 1 or 2 and R^3 has the same meanings as R^1 and is identical to or different from R^1 or together with R^1 forms a diradical of the formula $—(CH_2)_k—X—(CH_2)_l—$, where k and l independently of one another are each 1, 2, 3, 4 or 5, and X is O, S or NH, or Z—R^1 is unsubstituted or alkyl, alkoxy, alkylthio, alkylsulfonyl, halogen, haloalkyl nitro or cyano substituted phenyl, or a plant-tolerated acid addition salt thereof, with the proviso that Het may also be pyrid-3-yl when Z is oxygen, SO_t or (R^3N) where t is 1 or 2.

4. A process for combatting fungi, wherein the fungi or the materials, plants, soil or seed to be protected against fungus attack are treated with an effective amount of a compound of the formula



(I)

where R^2 is a 5-membered or 6-membered unsaturated heterocyclic structure possessing one or two hetero atoms or is phenyl which is unsubstituted or substituted by R_n, R is hydrogen, alkyl, alkoxy, alkylthio, alkylsulfonyl, halogen, haloalkyl, nitro, cyano, unsubstituted or halogen, cyano, nitro or halo-C_1–C_2-alkyl substituted phenyl, unsubstituted or halogen, cyano, nitro or halo-C_1–C_2-alkyl substituted phenoxy or unsubstituted or C_1–C_4-alkyl substituted amino, R^1 is C_1–C_{10}-alkyl, C_3–C_8-cycloalkyl, C_4–C_{11}-cycloalkyl-alkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aryl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aralkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aryloxyalkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted benzyloxyalkyl, C_2–C_4-alkenyl, propargyl, butynyl or $(CH_2—CH_2O)_m—R^4$, where R^4 is C_1–C_4-alkyl, unsubstituted or chloro-substituted aryl or unsubstituted or chloro-substituted benzyl and m is 1, 2, 3 or 4, Het is 1,2,4-triazol-1-yl or imidazol-1-yl, n is 1, 2, 3, 4 or 5, Z is oxygen, SO_t or, (R^3N) where t is 0, 1 or 2 and R^3 has the same meanings as R^1 and is identical to or different from R^1 or together with R^1 forms a diradical of the formula $—(CH_2)_k—X—(CH_2)_l—$, where k and l independently of one another are each 1, 2, 3, 4 or 5, and X is O, S or NH, or Z—R^1 is unsubstituted or alkyl, alkoxy, alkylthio, alkylsulfonyl, halogen, haloalkyl nitro or cyano substituted phenyl, or a plant-tolerated acid addition salt thereof, with the proviso that Het may also be pyrid-3-yl when Z is oxygen, SO_t or (R^3N) where t is 1 or 2.

4,639,448

7-AMINO-3-[SUBSTITUTED VINYL]-3-CEPHEM-4-CARBOXYLATES HAVING ANTIMICROBIAL ACTIVITY

Takao Takaya, Kawanishi; Hisashi Takasugi, Hamagutinishi; Hideaki Yamanaka, Hirakata; Kenji Miyai, Kawanishi, and Yoshikazu Inoue, Amagasaki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

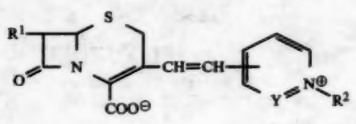
Division of Ser. No. 528,796, Sep. 2, 1983, Pat. No. 4,546,101. This application Jun. 4, 1985, Ser. No. 741,267

Claims priority, application United Kingdom, Sep. 10, 1982, 8225836; Apr. 29, 1983, 8311815

Int. Cl.[4] C07D *501/24;* A61K *31/54*

U.S. Cl. 514—226 **6 Claims**

1. A cephem compound of the formula:



wherein

R^1 is amino,

R^2 is lower alkyl, and

Y is CH or N,

and pharmaceutically acceptable salts thereof.

5. A method of treatment of infectious diseases which comprises administering a compound of claim **1** or pharmaceutically acceptable salt thereof to a human being or animal.

4,639,449

MORPHOLINE CONTAINING PROPIONYLANILIDES AND PHARMACEUTICAL COMPOSITIONS

Egidio Molinari, Longone al Segrino, Italy, assignor to Erregierre Industria Chimica Spa, San Paolo d'Argon (BG), Italy

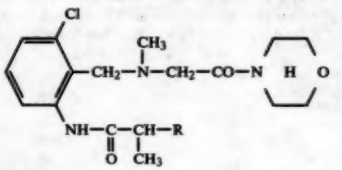
Filed Apr. 23, 1986, Ser. No. 854,789

Claims priority, application Italy, May 15, 1985, 20726 A/85

Int. Cl.[4] A61K *31/535;* C07D *295/18*

U.S. Cl. 514—234 **2 Claims**

1. Propionylanilides, and relative salts of addition, of formula:



(I)

in which R is chosen from the group consisting of 4-isobutylphenyl, 3-benzoylphenyl, 6-methoxy-2-naphthyl and 2-fluoro-4-diphenyl.

2. Pharmaceutical compositions containing as active principle at least one propionylanilide claimed in claim **1**, together with pharmacologically acceptable dispersants and/or diluents.

4,639,450

POLYPRENYLCARBOXYLIC ACID MORPHOLIDES AND PHARMACEUTICAL COMPOSITIONS

Isao Yamatsu, Kawaguchi; Yuichi Inai; Shinya Abe, both of Tokyo; Hideaki Watanabe, Aichi; Toshiji Igarashi, Tokorozawa; Hiroyuki Shiojiri, Sayama; Yoshio Tanabe, Saitama, and Kumiko Hara, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

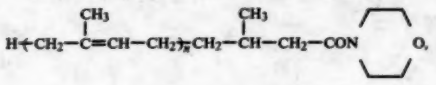
Continuation of Ser. No. 503,205, Jun. 10, 1983, abandoned, which is a division of Ser. No. 175,213, Aug. 4, 1980, Pat. No. 4,456,603. This application Dec. 4, 1984, Ser. No. 677,893

Claims priority, application Japan, Aug. 14, 1979, 54-102747; Aug. 28, 1979, 54-108668

Int. Cl.[4] A61K *31/535;* C07D *295/18*

U.S. Cl. 514—238 4 Claims

1. A compound having the formula:



wherein n is an integer of 1 to 4.

4. A pharmaceutical composition for treating liver dysfunction which comprises an effective amount of a compound as claimed in claim 1 as an active ingredient, and at least one pharmaceutically acceptable inert carrier or diluent.

4,639,451

PYRIDAZINONE DERIVATIVES

Tsutomu Katakami; Nobuyuki Fukazawa, both of Yokohama; Hajime Iizuka, Hiratsuka; Takashi Nishina, Mobara; Joji Kamiya, Mobara; Yasuhito Tanaka, Mobara, and Takuo Nakano, Yokohama, all of Japan, assignors to Mitsui Toatsu Kagaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00415, § 371 Date Jun. 3, 1983, § 102(e) Date Jun. 3, 1983, PCT Pub. No. WO83/01447, PCT Pub. Date Apr. 28, 1983

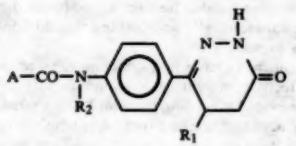
PCT Filed Oct. 20, 1982, Ser. No. 504,039

Claims priority, application Japan, Oct. 20, 1981, 56-166437; Oct. 20, 1981, 56-166438; Dec. 28, 1981, 56-209937

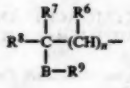
Int. Cl.[4] C07D *237/04;* A61K *31/50*

U.S. Cl. 514—247 22 Claims

1. A pyridazinone derivative of the formula:



wherein R^1 stands for a hydrogen atom or a methyl group; R^2 for a hydrogen atom or a lower alkyl group; and A for a grouping of the formula:



wherein R^6, R^7 and R^8 each stand for a hydrogen atom or a lower alkyl group, B is an oxygen atom or a sulfur atom, R^9 stands for a hydrogen atom or a lower alkanoyl group, and n is 0 or 1.

4,639,452

ARYLIC DERIVATIVES OF PIPERAZINE, THE METHOD OF PREPARING SAME AND THEIR APPLICATION IN THERAPEUTICS

Alain Y. Platel, Rueil Malmaison; Guy R. Bourgery, Colombes, both of France, and Alain Lacour, deceased, late of Saint Maur des Fossés, France (by Hélène Christiane José Guiblain, Cécile Hélène Laurence Lacour, Laurent Pierre Rolland Lacour, heirs), assignors to Delalande S.A., Courbevoie, France

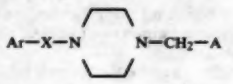
Filed Feb. 25, 1983, Ser. No. 469,968

Claims priority, application France, Feb. 26, 1982, 82 03256

Int. Cl.[4] C07D *295/18;* A61K *31/495*

U.S. Cl. 514—252 21 Claims

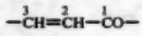
1. New compounds having the general formula:



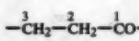
(I)

in which X represents:

either the chain of trans configuration



or the chain



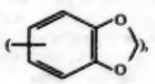
connected to Ar by their carbon atom 3, in which case A represents:

a carbohydroxamic (—CONHOH), Ar then representing the (3,4,5-trimethoxy)phenyl nucleus,

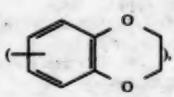
a carboxyl group (COOH), Ar then representing the para-chlorophenyl, para-hyroxyphenyl, (3,4-methylenedioxy)-phenyl or (3,5-dimethoxy 4-hydroxy)phenyl nucleus, or

an amido group of structure $CO—NR_2R_3$ in which the pair (R_2, R_3) takes on one of the following meanings: (H,H), (C_1–C_4 alkyl, C_1–C_4 alkyl), (H, C_3–C_6 cycloalkyl), (H, C_3–C_6 cycloalkylmethyl), (H, phenyl), (H, phenyl substituted by one or more halogen atoms), (H, phenyl substituted by one or more methyl or methoxy groups), (H, benzyl), (H, benzyl substituted by one or more halogen atoms), (H, benzyl substituted by one or more methyl or methoxy groups), (CH_3, benzyl), (CH_3, benzyl substituted by one or more halogen atoms), (CH_3, benzyl substituted by one or more methyl or methoxy groups), (H, allyl), (H, propargyl), R_2, R_3 being also able to form jointly with the nitrogen atom to which they are linked, a pyrrolidino, piperidino, or morpholino radical; Ar then representing a phenyl nucleus, a phenyl nucleus substituted by one or more halogen atoms, by one or more methoxy groups, by a methyl group, by a trifluoromethyl group or by one or two hydroxy radicals,

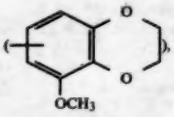
a 1,3-benzodioxolyl group:



a 1,4-benzodioxannyl group:

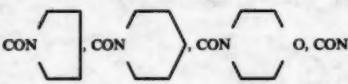


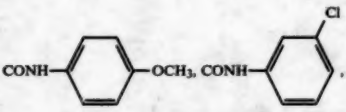
a (5-methoxy) 1,4-benzodioxannyl group:



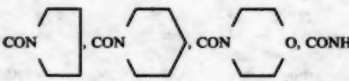
a naphthyl group, the (3-methoxy 4-hydroxy)phenyl group, the (3-hydroxy 4-methoxy)phenyl group, the (3,5-dimethoxy 4-hydroxy)phenyl group or a (4-C_2-C_4 alkoxy 3,5-dimethoxy)phenyl group;

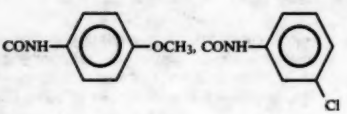
A not however being able to assume the following values: $CONH_2$, $CON(C_1$-C_4 alkyl$)_2$,





when Ar represents the (3,4,5-trimethoxy)phenyl group; A not however being able to assume the following values: $CONH_2$, $CON(C_1$-C_4 alkyl$)_2$,

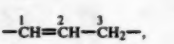




when Ar represents the (3,5-dimethoxy 4-hydroxy)phenyl group and A not however being able to assume the value $CON(C_2H_5)_2$ when Ar=2-hydroxyphenyl and X=CH_2—CH_2CO;

or an N-isopropylcarboxamido, Ar then representing a (3-methoxy 4-hydroxy)phenyl nucleus;

or the chain of trans configuration



linked to Ar by its carbon atom 1 or the chain —CH-$_2$—CH_2—CH_2—, in which case A represents a carboxamido, N-isopropylcarboxamido, pyrrolidinocarbonyl or piperidinocarbonyl group, Ar then representing a (3,4,5-trimethoxy)phenyl or (3,4-methylenedioxy)phenyl group, with the proviso that A cannot represent a pyrrolidinocarbonyl group when Ar=(3,4,5-trimethoxy)phenyl,

as well as the acid addition salts thereof and the hydrates of these derivatives and salts.

4,639,453

SUBSTITUTED 1-(4-AMINO-6,7-DIALKOXYQUINAZOLINYL)-4 CYCLOHEXENYL DERIVATIVES OF PIPERAZINE AND HOMOPIPERAZINE, PROCESSES FOR THEIR PREPARATION AND THEIR USE, FORMULATIONS CONTAINING THESE COMPOUNDS AND INTERMEDIATES

Werner Hansen, Hamburg, Fed. Rep. of Germany, assignor to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

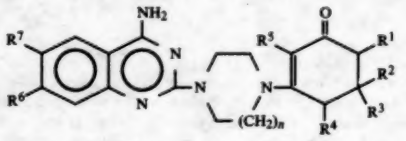
Filed Dec. 7, 1984, Ser. No. 679,178

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346675

Int. Cl.[4] A61K *31/505;* **C07D** *403/04, 405/14*

U.S. Cl. 514—254 **10 Claims**

1. Substituted 1-(4-amino-6,7-dialkoxyquniazolinyl)-4-cyclohexenyl derivatives of piperazine and homopiperazine, of the formula I



(I)

in which

R^1, R^2, R^3, R^4 and R^5, which can be indentical or different, denote hydrogen, straight-chain or branched alkyl with in each case 1 to 6 carbon atoms, carbocyclic aliphatic groups with in each case 5 to 7 carbon atoms, mono- or bi-cyclic carbocyclic aromatic radicals or substituted mono- or bi-cyclic carbocyclic aromatic radicals, which can be monosubstituted or polysubstituted by identical or different substituents selected from the group consisting of halogen, lower alkyl and alkoxy with in each case 1 to 4 carbon atoms in the alkyl part or denote aralkyl radicals in which the alkyl portions is C_1-C_4-alkyl and the aryl portion is monocyclic carbocylic aryl, furanyl radicals or thienyl radicals, or

R^2 and R^3 together denote the group —$(CH_2)_a$—, wherein a is the number 4 to 5, or

R^3 and R^4 together denote the group —$(CH_2)_b$— wherein b is the number 3, 4 or 5,

R^6 and R^7, which can be identical or different denote alkoxy groups with 1 to 4 carbon atoms in the alkyl part, which can be straight-chain or branched, and

n denotes the number 1 and 2, the tautomeric forms thereof, as well as pharmaceutically acceptable acid addition salts and hydrates thereof.

5. A pharmaceutical composition containing, as an active ingredient an effective amount of a cardiovascular system regulator of a compound according to claim 1 or a pharmaceutically acceptable acid addition salt thereof in admixture with an inert pharmaceutical carrier.

4,639,454

PHENYLQUINAZOLINECARBOXYLIC ACIDS AND DERIVATIVES AS CANCER CHEMOTHERAPEUTIC AGENTS

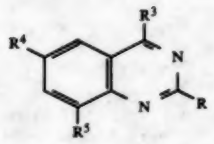
David P. Hesson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 17, 1985, Ser. No. 692,412

Int. Cl.[4] A61K *31/505;* **C07D** *239/74*

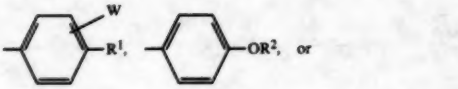
U.S. Cl. 514—259 **21 Claims**

1. A quinazoline-4-carboxylic acid having the formula:

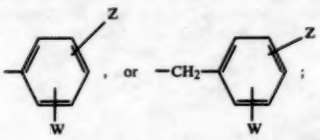


(I)

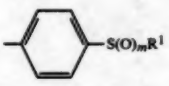
wherein
R is



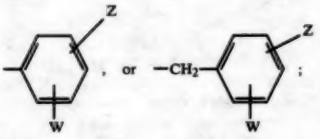
R^1 is alkyl of 5–12 carbon atoms, cycloalkyl of 3–7 carbon atoms, cycloalkyl alkyl of 4–12 carbon atoms, cycloalkenyl of 5–7 carbon atoms,



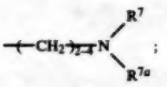
with the proviso that when R is



then R^1 can be in addition alkyl of 3–4 carbon atoms;
m is 0 or 1;
R^2 is



W and Z are independently H, F, Cl, Br, alkyl of 1–5 carbon atoms, NO_2, alkoxy of 1–5 carbon atoms, OH, CF_3, or NH_2;
R^3 is COOH, or $COOR^6$;
R^4 and R^5 are independently H, halogen, CF_3, or alkyl of 1 or 2 carbon atoms;
R^6 is



R^7 and R^{7a} are independently H or alkyl of 1–3 carbon atoms;

or a pharmaceutically suitable salt thereof.

15. A method of treating lymphoid leukemia in a mammal which comprises administering to a mammal an effective amount of at least one compound of claim 1.

4,639,455

MEANS OF AIDING IN THE PREVENTION OF SUDDEN INFANT DEATH SYNDROME

Luana Moore, Miami Beach, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Oct. 2, 1984, Ser. No. 657,096
Int. Cl.[4] A61K *31/41*
U.S. Cl. 514—282 **7 Claims**

1. A method aiding in the prevention of SIDS, comprising: administering a pharmaceutically effective amount of 6-methylene-6-desoxy-N-cyclopropylmethyl-14-hydroxydihydronormorphone to an infant determined to be susceptible to SIDS so as to block the attachment of endogenous endorphins to nerve receptor sites responsible for the actuation of respiration.

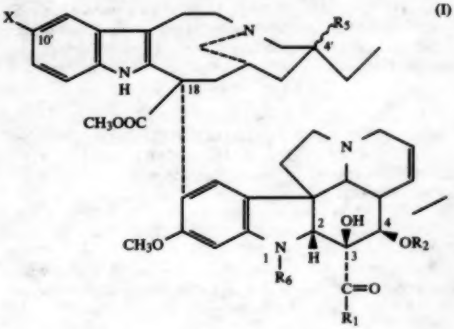
4,639,456

VINBLASTIN-23-OYL AMINO ACID DERIVATIVES

Andre B. L. Trouet, Winksele; Jean A. A. J. Hannart, Dion Valmont, and Kandukuri S. B. Rao, Rosieres, all of Belgium, assignors to Omnichem S.A., Belgium

Continuation-in-part of Ser. No. 269,876, Jun. 3, 1981, Pat. No. 4,388,305. This application Dec. 3, 1982, Ser. No. 446,708
Claims priority, application Luxembourg, Jun. 10, 1980, 82514; Dec. 23, 1980, 83034; Dec. 8, 1981, 83822
The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.
Int. Cl.[4] C07D *519/04, 47/16*; A61K *31/40*
U.S. Cl. 514—283 **20 Claims**

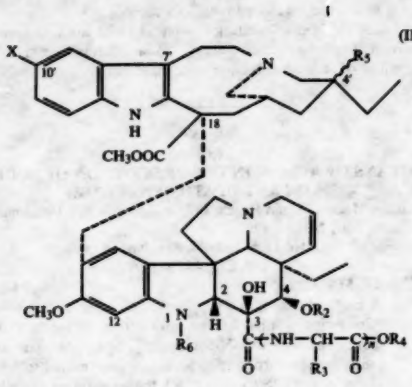
1. A vinblastine group of the formula



(I)

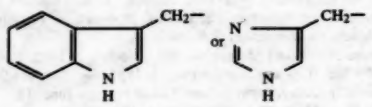
wherein R_1 is an ester, attached through the nitrogen of a α-aminoacid selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, serine, threoinine, aspartic acid, glutamic acid, aspargine, glutamine, arginine, lysine, cysteine, cystine, methionine, phenylalanine, tyrosine, tryptophan, proline, histidine, hydroxy-lysine, hydroxyproline, or of a peptide consisting of 2–6 identical or different such aminoacids, and the ester group, which may be straight or branched, being a carboalkoxy group having 2–9 carbon atoms, and R_2 is hydrogen or a C_2–C_9 alkanoyl group, R_5 is H or OH, R_6 is CH_3, CHO or H and X is Br and their pharmaceutically acceptable mineral or organic acid addition salts.

2. A vinblastine group of the formula



(II)

wherein R_2 is a hydrogen atom or a C_2–C_3 alkanoyl group, R_3 is a hydrogen atom, straight or branched C_1–C_8 alkyl, hydroxy - C_1–C_8 -alkyl, carboxy -C_1–C_8 -alkyl, amido -C_1–C_8- alkyl, amino -C_1–C_8-alkyl or hydroxyalkyl, guanadino -C_1–C_8- alkyl, sulfydryl -C_1–C_8alkyl, methylthio-ethyl, benzyl, hydroxy-benzyl, or a group:



or R_3 together with the carbon to which it is attached and the amido nitrogen, forms an azole or an hydroxy-azole ring; n is an integer of from 1 to 6; and R_4 is a straight or branched C_1–C_8-alkyl, or a benzyl group R_5 is H or OH; R_6 is CH_3, CHO or H and X=Br, and their pharmaceutically acceptable mineral and organic acid addition salts.

19. The method of treating leukemia, solid tumors treatable with vinblastine, vincristine or vindesine or Hodgkins disease which comprises administering to a cancer patient in therapeutically effective amount, a compound as defined in claim **2**.

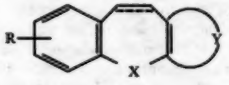
4,639,457

BENZOCYCLOHEPTAPYRIDONE COMPOUNDS FOR TREATING CONGESTIVE HEART FAILURE

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 19, 1985, Ser. No. 766,472
Int. Cl.[4] A61K *31/44;* **C07D** *221/16*
U.S. Cl. 514—290 **9 Claims**

9. A method for treating congestive heart failure which comprises administering to a patient suffering from congestive heart failure, a therapeutic amount of a compound having the formula:



wherein:

the ⚌ bond designation indicates that the bond may be a saturated single bond or an unsaturated double bond;

X is —C=O or —CHOH;

Y is —NHCOCH=CH—;

wherein the ends of the chain may be attached to the carbon of the ring in either direction so that either —NH— or =CH— is attached to the carbon adjacent to X; and

R is hydrogen, lower alkoxy, cyano, halo, trifluoromethylthio, or lower alkylthio.

4,639,458

TABLET AND FORMULATION

Ashok V. Katdare, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 22, 1985, Ser. No. 693,071
Int. Cl.[4] A61K *31/47, 9/20*
U.S. Cl. 514—311 **3 Claims**

1. A composition containing by weight, about 80–85% norfloxacin, about 13.5–18.5% microcrystallin cellulose, about 0.5–2% magnesium stearate, and about 1–4.5% croscarmellose sodium.

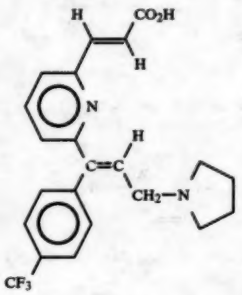
4,639,459

USE OF TRIFLUOROMETHYL COMPOUNDS

John W. A. Findlay, Chapel Hill, N.C., and Geoffrey G. Coker, Bromley, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 462,788, Feb. 1, 1983, abandoned. This application Aug. 29, 1985, Ser. No. 771,142
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—343 **4 Claims**

1. A method of obtaining an antihistaminic effect in a human in need thereof comprising administering an effective antihistaminic amount of the compound of formula I



I

or a pharmaceutically acceptable salt thereof to said human.

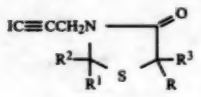
4,639,460

FUNGICIDAL SUBSTITUTED N-(1-IODOPROPARGYL)THIAZOLIDINONES

Bernard F. Rose, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 762,660, Aug. 5, 1985, which is a continuation of Ser. No. 629,657, Jul. 11, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 845,160
Int. Cl.[4] C07D *277/14;* **A01N** *43/78*
U.S. Cl. 514—369 **25 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl; or aryl or aralkyl having from 6 to 12 carbon atoms, optionally substituted with one to three substituents, each independently with one to three substituents, each independently selected from halogen, cyano,

lower alkyl, lower alkoxy, nitro or trihalomethyl; R^1 is alkyl having from 1 to 12 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms; aryl or aralkyl having from 6 to 12 carbon atoms optionally substituted with one to three substituents, each independently selected from halogen, cyano, lower alkyl, lower alkoxy, nitro, trihalo-substituted methyl, phenyl, phenoxy, substituted phenoxy substituted with 1 to 3 substituents independently selected from halogen, lower alkyl, lower alkoxy or trihalomethyl, benzyloxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, arylthio (C_6 to C_{12}), or two lower alkoxy groups joined to give an alkylene bridge; or thiophene or furanyl either opionally substituted with 1 to 3 substituents independently selected from halogen, trihalomethyl, lower alkyl, lower alkoxy; R^2 is hydrogen, lower alkyl, cycloalkyl having from 3 to 8 carbon atoms, or aryl or aralkyl having from 6 to 12 carbon atoms optionally substituted with one to three substituents, each independently selected from halogen, cyano, lower alkyl, lower alkoxy, nitro or trihalomethyl; and R^3 is hydrogen or lower alkyl.

4,639,461

7-OXABICYCLOHEPTANE SUBSTITUTED KETO-AMIDE PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

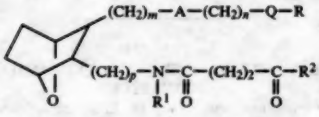
Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 28, 1985, Ser. No. 791,819

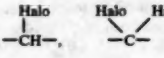
Int. Cl.[4] A61K *31/557*; **C07D** *307/00, 405/08*

U.S. Cl. 514—382 **15 Claims**

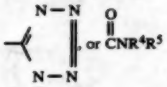
1. A compound having the structure



including all stereoisomers thereof, wherein m is 0 to 4; A is —CH=CH— or —CH_2—CH_2—; n is 1 to 5; Q is —CH=CH—, —CH_2—,



or a single bond; R is CO_2H, CO_2alkyl, CO_2 alkali metal, CO_2 polyhydroxyamine salt,



wherein R^4 and R^5 are the same or different and are H, lower alkyl, hydroxy, lower alkoxy or aryl at least one of R^4 and R^5 being other than hydroxy and lower alkoxy; p is 1 to 4; R^1 is H or lower alkyl; and R^2 is H, lower alkyl, lower alkenyl containing 2 to 12 carbons, aryl, arylalkyl, cycloalkyl or cycloalkylalkyl; wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with a halo-substituent, such as F, Br, Cl or I or CF_3, an alkoxy substituent, an aryl substituent, an alkyl-aryl substituent, a haloaryl substituent, a cycloalkyl substituent, an alkylcycloalkyl substituent, hydroxy, an amino substituent, an amido substituent, an alkylamino substituent, an arylamino substituent, an alkanoylamino substituent, an arylcarbonylamino substituent, a thioamido substituent, a nitro substituent, a cyano substituent, a thiol substituent, an arylthio substituent or an alkylthio substituent; cycloalkyl alone or as part of another group includes saturated cyclic hydrocarbon groups containing 3 to 12 carbons, which is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups, and/or 1 or 2 alkylthio groups; aryl or Ar alone or as part of another group is phenyl or naphthyl, which is unsubstituted or substituted with 1 or 2 lower alkyl groups, halogens selected from the group consisting of Cl, Br, or F, 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 amino groups, 1 or 2 alkylamino groups, 1 or 2 arylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amido groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thioamido groups, 1 or 2 thiol groups, 1 or 2 arylthio groups, and/or 1 or 2 alkylthio groups;

$(CH_2)_m$, $(CH_2)_n$ or $(CH_2)_p$ may independently contain 1 or 2 lower alkyl and/or 1 or 2 halo substituents.

11. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,639,462

HETEROCYCLO-HYDROXYALKYL-AZOLYL DERIVATIVES AND USE AS FUNGICIDES

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Graham Holmwood; Erik Regel, both of Wuppertal; Paul Reinecke, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 1, 1983, Ser. No. 547,807

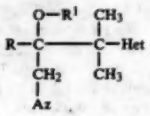
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242252

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] A01N *43/50, 43/61*; **C07D** *233/60, 249/08*

U.S. Cl. 514—383 **12 Claims**

1. A heterocyclyl-hydroxyalkyl-azolyl derivative of the formula



(I)

in which

Az represents 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl or imidazol-1-yl,

Het represents dioxolan-2-yl or 1,3-dioxanyl, each of which is optionally substituted by identical or different substituents selected from the group consisting of alkyl with 1 to 4 carbon atoms, and phenyl and phenoxyalkyl with 1 to 4 carbon atoms in the alkyl part, each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms and halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms;

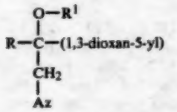
R represents straight-chain or branched alkyl with 1 to 7 carbon atoms, or phenyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl part, phenoxy- or phenylthio-alkyl with in each case 1 to 4 carbon atoms in the alkyl part or phenylethenyl, each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, nitro, halogenoalkyl, halogenoalkoxy and

halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, hydroximinoalkyl with 1 to 4 carbon atoms, alkoximinoalkyl with 1 to 4 carbon atoms in each alkyl part, and phenyl, phenoxy, benzyl and benzyloxy, each of which is optionally substituted by halogen or alkyl with 1 or 2 carbon atoms; or R represents cycloalkyl with 5 to 7 carbon atoms, which is in each case optionally monosubstituted or polysubstituted by identical or different alkyl radicals with 1 to 4 carbon atoms, or cycloalkyl-methyl or -ethyl with 5 to 7 carbon atoms in the cycloalkyl part, or cyclohexylethenyl, or, alkenyl with 2 to 6 carbon atoms, 2-furyl, naphthyloxymethyl, 1,2,4-triazol-1-yl-methyl, 1,2,4-triazol-4-yl-methyl, imidazol-1-yl-methyl or pyrazol-1-yl-methyl,

R' represents hydrogen, alkyl which has 1 to 4 carbon atoms and is optionally substituted by phenyl, it being possible for the phenyl radical to be substituted by the substituents on phenyl mentioned under R, or alkenyl with 2 to 4 carbon atoms,

or an addition product thereof with an acid or metal salt.

2. A heterocyclyl-hydroxyalkyl-azolyl derivative of the formula



in which

Az represents 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl or imidazol-1-yl; the 1, 3- dioxan-5-yl is optionally substituted by identical or different substituent selected from the group consisting of alkyl with 1 to 4 carbon atoms, and phenyl and phenoxyalkyl with 1 to 4 carbon atoms, and phenyl and phenoxyalkyl with 1 to 4 carbon atoms in the alkyl part, each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms and halogenoalkyl, halogenoalkoxy and halogenoalkythio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms;

R represents straight-chain or branched alkyl with 1 to 7 carbon atoms, or phenyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl part, phenoxy- or phenylthio-alkyl with in each case 1 to 4 carbon atoms in the alkyl part or phenylethenyl each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, nitro, halogen alkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, hydroximinoalkyl with 1 to 4 carbon atoms, alkoximinoalkyl with 1 to 4 carbon atoms in each alkyl part, and phenyl, phenoxy, benzyl and benzyloxy, each of which is optionally substituted by halogen or alkyl with 1 or 2 carbon atoms; or R represents cycloalkyl with 5 to 7 carbon atoms, which is in each case optionally monosubstituted or polysubstituted by identical or different alkyl radicals with 1 to 4 carbon atoms, or cycloalkyl-methy or -ethyl with 5 or 7 carbon atoms in the cycloalkyl part, or cyclothexylethenyl, or, alkenyl with 2 to 6 carbon atoms, 2-furyl, naphthyloxymethyl, 1,2,4-triazol-1-yl-methyl, 1,2,4-triazol-4-yl-methyl, imidazol-1-yl-methyl or pyrazol-1-yl-methyl,

R' represents hydrogen, alkyl which has 1 to 4 carbon atoms and is optionally substituted by phenyl, it being possible for the phenyl radical to be substituted by the substituents on phenyl mentioned under R, or alkenyl with 2 to 4 carbon atoms.

or an addition product thereof with an acid or metal salt.

4,639,463

SUBSTITUTED PHENYLSULFONYLOXYBENZIMIDAZOLECARBAMATES AND ANTHELMINTIC COMPOSITIONS

Manfred Rösner, Eppstein; Heinz Loewe, Kelkheim; Dieter Düwel, Hofheim am Taunus, and Reinhard Kirsch, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

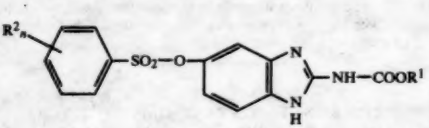
Filed Dec. 21, 1983, Ser. No. 563,780

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247615

Int. Cl.⁴ A61K *31/415;* **C07D** *403/30, 235/04, 471/00*

U.S. Cl. 514—395 **15 Claims**

1. A phenylsulfonyloxybenzimidazolecarbamate of the formula I



I

in which R^1 denotes straight-chain or branched alkyl having 1–4 carbon atoms, n denotes 1 or 2, and the individual substituents R^2, independently of one another, denote 1,1,2,2-tetrafluoroethoxy, cycloalkyl having 3–8 carbon atoms or 4-fluoro.

4. Method of treating a patient or animal suffering from infection by helminths by administering an effective amount of a substituted phenylsulfonyloxybenzimidazolecarbamate of the formula I in claim 1.

4,639,464

ANTIHYPERTENSIVE SUBSTITUTED IMIDAZOLE DERIVATIVES

Arto J. Karjalainen, and Kauko O. A. Kurkela, both of Oulu, Finland, assignors to Farmos Group, Ltd., Turku, Finland

Division of Ser. No. 396,000, Jul. 7, 1982, Pat. No. 4,544,664. This application Mar. 19, 1985, Ser. No. 713,654

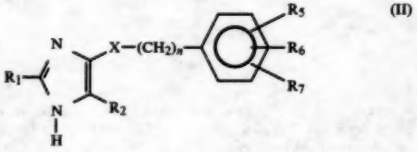
Claims priority, application United Kingdom, Jul. 10, 1981, 8121333

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.⁴ A61K *31/415;* **C07D** *405/06, 233/64*

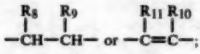
U.S. Cl. 514—396 **18 Claims**

17. A pharmaceutical composition useful for producing an antihypertensive effect comprising an effective amount of a substituted imidazole of the formula:



(II)

wherein R_1 is H, an alkyl of 1 to 4 carbon atoms or $—CH_2OH$; R_2 is H or CH_3; X is



R_5, R_6 and R_7, which can be the same or different, are H, $—CH_3$, $—CH_2CH_3$, halogen, OH or $—OCH_3$, but are not all hydrogen or R_5 is hydrogen and R_6 and R_7 together form an $—O—CH_2—O—$bridge between two adjacent carbon atoms in the phenyl group; $—CHR_8—$ is $—CH_2—$, $—CH(CH_3)—$, $—CH(—CH_2CH_3)—$, $—CH(—CH_2CH_2CH_3)—$,

—CH(—$CH_2CH_2CH_2CH_3$)— or >C=CH_2, >C=CH—CH_3, >C=CH—CH_2CH_3,

or >C=CH—$CH_2CH_2CH_3$; R_9 is H, —CH_3, —CH_2CH_3, —$CH_2CH_2CH_3$,

—$CH_2CH_2CH_2CH_3$ or OH; R_{10} is H, —CH_3, —CH_2CH_3, —$CH_2CH_2CH_3$,

or —$CH_2CH_2CH_2CH_3$; R_{11} is H, —CH_3, —CH_2CH_3, —$CH_2CH_2CH_3$,

or —$CH_2CH_2CH_2CH_3$; n is 0 to 4; provided that R_8 and R_9 or R_{11} and R_{10} are not simultaneously hydrogen, or a non-toxic pharmaceutically acceptable acid addition salt thereof and a compatible, pharmaceutically acceptable carrier therefor.

4,639,465

METHOD AND COMPOSITION FOR RELIEVING PAIN

Robert L. Pollack, Philadelphia, and Lawrence Durst, Bridgeport, both of Pa., assignors to Commonwealth Medical Corporation of America, Allentown, Pa.

Filed Aug. 30, 1985, Ser. No. 771,325
Int. Cl.[4] A61K *31/40, 31/70, 31/435*
U.S. Cl. 514—419 **10 Claims**

1. A dietary supplement for increasing a patient's threshold of pain via steady and prolonged production of serotonin withinthe patient's brain, comprising:

approximately 5 to 15 parts by weight of L-tryptophan for increasing said production of serotonin and approximately 5 to 15 parts by weight of fructose for producing a steady release of insulin into the patient's blood increasing transport of L-tryptophan from the patient's blood plasma into the patient's brain.

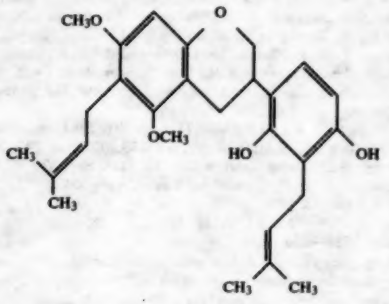
4,639,466

3',6-DIISOPENTENYL-2',4'-DIHYDROXY-5,7-DIMETHOXY-ISOFLAVAN AND RELATED COMPOUNDS USEFUL AS ANXIOLYTIC AGENTS AND AVERMECTIN ANTIDOTES

Leeyuan Huang, Westfield, and Y. K. Tony Lam, Plainsboro, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 1, 1984, Ser. No. 656,554
Int. Cl.[4] A61K *31/35*
U.S. Cl. 514—456 **1 Claim**

1. A method of treatment or management of CNS disorders mediated by benzodiazepine receptors and intoxication caused by avermectin comprising the administration to a mammalian species in need of such treatment an effective amount of a compound of structural formula:



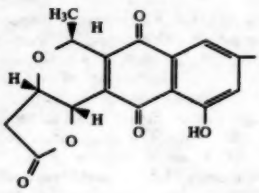
4,639,467

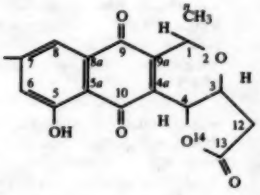
ANTIBIOTIC CRISMAICIN A AND COMPOSITIONS THEREOF

Martin S. Celino, deceased, late of Lucena City; by Cecilio Celino, administrator, and Antonio Larrauri, administrator, both of San Pablo City, Laguna, all of Philippines

Continuation-in-part of Ser. No. 603,621, Apr. 25, 1984, abandoned. This application Apr. 11, 1985, Ser. No. 722,207
Int. Cl.[4] C07D *493/04*; A61K *31/365*
U.S. Cl. 514—468 **8 Claims**

1. A substantially pure compound having the formula:





4,639,468
DERIVATIVES OF GLYCINAMIDE, THEIR PREPARATION AND THEIR USE

Roméo Roncucci, Paris, France; Claude L. Gillet, Blanmont, Belgium; Alexis H. Cordi, Villers-la-Ville, Belgium; Mark A. Martens, Zottegem, Belgium; Joseph L. Roba, Houyet, Belgium; Paul J. Niebes, Grez-Doiceau, Belgium; Georges E. Lambelin, and William R. Van Dorsser, both of Brussels, Belgium, assignors to Continental Pharma Inc., Brussels, Belgium

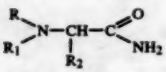
Continuation of Ser. No. 458,756, Apr. 21, 1983, abandoned, which is a continuation of Ser. No. 133,102, Mar. 24, 1980, abandoned. This application Aug. 23, 1985, Ser. No. 768,185

Claims priority, application Luxembourg, Mar. 22, 1979, 81068; Mar. 22, 1979, 81069

Int. Cl.[4] A61K *31/16, 31/165*

U.S. Cl. 514—620 **5 Claims**

1. A pharmaceutical composition containing as the active ingredient an effective amount, for the treatment of epilepsy, dyskinesiae, memory troubles and psychic troubles, of a glycinamide derivative of the formula:



wherein:

R is a linear pentyl group, or a linear or branched C_2–C_5 alkyl group substituted by at least one phenyl group or at least one halo-substituted phenyl group,

R_1 is hydrogen, and

R_2 is hydrogen,

or the non-toxic, pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable carrier or diluent.

4,639,469
METHOD OF PREPARING SOBRIEROL AND THE PHARMACEUTICAL APPLICATION OF THE SOBRIEROL THUS OBTAINED

Camillo Corvi-Mora, Via Spiga, 42, Milan, Italy

Continuation of Ser. No. 198,269, Oct. 17, 1980, abandoned, which is a continuation of Ser. No. 13,414, Feb. 21, 1979, abandoned, which is a continuation of Ser. No. 622,415, Oct. 14, 1975, abandoned, which is a continuation of Ser. No. 94,188, Dec. 1, 1970, abandoned. This application Sep. 30, 1982, Ser. No. 429,445

Claims priority, application Italy, Apr. 17, 1970, 23490 A/70

Int. Cl.[4] A61K *31/045*

U.S. Cl. 514—729 **5 Claims**

1. A process for treating a patient with a respiratory disease which comprises treating the patient with high purity sobrerol-d,l substantially free of human irritants, including ketones and aldehydes, in a balsamic fluidizer and expectorant and respiratory analeptic amount, said sobrerol-d,l being produced by

in a first stage, epoxidizing α-pinene with a 15–30% solution of perbenzoic acid in chloroform at a temperature between −1° C. and −10° C. to obtain α-pinene epoxide

in a second stage, forming sobrerol-d,l by hydrating said pinene epoxide at 36°–100° C. and then at an ultimate temperature between about 72°–100° C. in an aqueous solution of carbon dioxide having a ratio of about 55–100 parts by weight of α-pinene epoxide for 100 parts by weight of aqueous CO_2 solution, said solution having a pH of 3.5–3.9;

washing the formed sobrerol-d,l with a solvent for adhering aldehyde and ketone impurities until free of ketone and aldehyde impurities, and

then drying the formed at least 98% pure sobrerol-d,l under conditions which prevent sublimation of the product to thereby produce a sobrerol-d,l free of aldehyde and ketone impurities suitable for therapeutic applications and having a melting point of 130°–131.5° C.

4,639,470
METHOD FOR MAKING METHANOL

R. Lawrence Mednick, Roslyn Heights, N.Y., and David B. Blum, Wayne, N.J., assignors to Chem Systems, Inc., New York, N.Y.

Continuation of Ser. No. 633,231, Jul. 23, 1984, Pat. No. 4,567,204, which is a continuation of Ser. No. 325,507, Nov. 27, 1981, abandoned, which is a continuation of Ser. No. 120,903, Feb. 12, 1980, abandoned. This application Dec. 20, 1985, Ser. No. 811,653

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[4] C07C *27/06*

U.S. Cl. 518—700 **3 Claims**

1. A process for preparing methanol from synthesis gas containing hydrogen and carbon monoxide comprising the steps:

(a) entraining methanol-forming catalyst particles in an inert liquid, said catalyst particles having an average particle size of less than about 125 microns;

(b) contacting said synthesis gas with said entrained catalyst in a reaction zone at a temperature of from 100° C. to 500° C. and at a pressure of from 200 to 10,000 psia;

(c) withdrawing from said reaction zone the inert liquid with said entrained catalyst and cooling the same in a cooling zone;

(d) recycling said inert liquid with said entrained catalyst particles back to said reaction zone; and

(e) withdrawing from said reaction zone methanol and unreacted synthesis gas.

4,639,471
PROCESS FOR PRODUCING POLYESTER POLYURETHANE

Koji Hirai; Shunro Taniguchi; Michihiro Ishiguro; Yoshifumi Murata; Shinichi Yokota; Masao Ishii; Noriaki Yoshimura, all of Kurashiki, and Takayuki Okamura, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

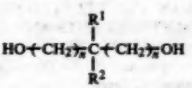
Filed Feb. 6, 1986, Ser. No. 826,595

Claims priority, application Japan, Feb. 12, 1985, 60-25428

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—172 **10 Claims**

1. In a process for producing a polyester polyurethane from a high-molecular weight polyol and a polyisocyanate, the improvement which comprises using as said polyol a polyester polyol which is obtained by reacting a dicarboxylic acid with a mixture of 1,9-nonanediol and a polyol represented by the formula

 [I]

wherein R^1 denotes methyl group or ethyl group, R^2 denotes hydrogen atom, methyl group, ethyl group, hydroxymethyl group or hydroxyethyl group, and n is an integer of 1 to 5, said polyester polyol having an average molecular weight of 500 to 30,000.

4,639,472

N-VINYL-2-OXAZOLIDINONES AS REACTIVE DILUENTS IN ACTINIC RADIATION CURABLE COATINGS

John G. Green, and David G. Hunt, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 682,450, Dec. 17, 1984, abandoned. This application Jul. 9, 1985, Ser. No. 753,089

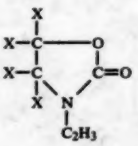
Int. Cl.[4] C08G 63/76

U.S. Cl. 522—107 14 Claims

1. An actinic radiation curable composition which comprises:

(a) an oligomer having a molecular weight within the range of from about 200 to about 3000 which is substantially comprised of polyester units and which is end capped with acrylate groups, methacrylate groups, or mixtures thereof to provide sites for free radical polymerization by actinic radiation; and

(b) as a reactive diluent, an N-vinyl-2-oxazolidinone having the formula,



wherein each X is independently selected from the group consisting of hydrogen and alkyl radicals, said alkyl radicals containing from 1 to about 4 carbon atoms.

4,639,473

THERMOPLASTIC MOULDING COMPOSITIONS

Frank Wingler, Leverkusen; Otto Koch; Joachim Doering, both of Cologne; Karl-Heinz Ott, Leverkusen, and Lothar Liebig, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 568,050, Jan. 4, 1984, abandoned. This application Nov. 22, 1985, Ser. No. 801,075

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301161

Int. Cl.[4] C08L 51/04

U.S. Cl. 525—83 6 Claims

1. A thermoplastic moulding composition of

(A) from 50 to 80 parts by weight of a graft polymer comprising from 70 to 30% by weight of a mixture of:

(a) an aromatic vinyl compound and

(b) acrylonitrile, methacrylonitrile or a mixture thereof; grafted onto 30 to 70% by weight of a rubber having a glass transition temperature of below −10° C. as the graft base; and

(B) from 20 to 95 parts by weight of a terpolymer of

(c) from 20 to 50 parts by weight of α-methyl styrene or α-methyl styrene mixed in a molar ratio of 1:0 to 1:1 with one or more monomers selected from the group consisting of styrene, acrylic acid alkyl esters, methacrylic acid alkyl esters, acrylic acid cyclohexyl esters, methacrylic acid cyclohexyl esters, acrylic acid phenyl esters, methacrylic acid phenyl esters, acrylic acid benzyl esters, methacrylic acid, acrylic acid amide, methacrylic acid amide, N-alkylacrylamide having 1–8 carbon atoms in the alkyl group, N-alkyl-methacrylamide having 1 to 8 carbon atoms in the alkyl group, o-chlorostyrene, m-chlorostyrene, p-chlorostyrene, o-chlorostyrene, p-cyanostyrene, o-methoxy styrene, m-methoxy styrene, p-methoxy styrene, p-isopropyl styrene and 2,5-dimethoxy styrene;

(d) from 20 to 50 parts by weight p-methyl styrene and

(e) from 10 to 40 parts by weight acrylonitrile, methacrylonitrile or a mixture thereof, the sum total of the parts by weight in the (c) to the (e) amounting to 100.

4,639,474

MONOLITHIC REFRACTORY COMPOSITION

Thomas F. Vezza, West Mifflin, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 8, 1983, Ser. No. 560,043

Int. Cl.[4] C21C 7/00

U.S. Cl. 523—141 5 Claims

1. A monolithic refractory composition having relatively high thermal conductivity and a relatively high degree of water insolubility consisting essentially of, by weight, 50–70% relatively large grain flake graphite, 5–30% micronized flake graphite and the remainder crude clay, and the addition based upon the total weight of said mix of 10–25% liquid thermosetting phenolic resin in combination with an alcoholic solvent, and a thermosetting resin curing agent.

4,639,475

ADHESIVE STICK AND A PROCESS FOR ITS PRODUCTION

Wolfgang Dierichs, Duesseldorf; Gerhard Gierenz, Solingen, and Gabriella Kraus, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 17, 1984, Ser. No. 601,183

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328099

Int. Cl.[4] C08F 3/56, 29/12

U.S. Cl. 523—164 10 Claims

1. An adhesive applicator crayon or stick comprised of an amount of more than 50% by weight of the finished crayon or stick of an adhesive resin dissolved and/or dispersed in an amount of at most 35% by weight of the finished crayon or stick of an aqueous solvent system, from 1% to 10% by weight of a gel-forming component and, optionally, other conventional additives for adhesive applicator crayons or sticks, whereby, when applied by rubbing onto a receiving surface, the adhesive layer produced has permanently tacky pressure-sensitive adhesive properties, said adhesive applicator crayon or stick consisting essentially of the reaction product of sorbitol and/or xylitol and benzaldehyde, as said gel-forming component, and the reaction mixture from the reaction of 1 part by weight of methyl vinyl ether/maleic acid anhydride copolymers with from 5 to 12 parts by weight of partially neutralized acid phosphate esters of nonionic wetting agents of the lower alkylene oxide adduct type (pH-value of a 10% solution of the phosphate esters being from 5 to 6), as said adhesive resin.

4,639,476

EPOXY RESIN POWDER COATING COMPOSITION

Kazuhiro Tajiri; Michio Kohmoto; Kiyoshi Saito, and Hitoshi Takahira, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 27, 1985, Ser. No. 749,251

Claims priority, application Japan, Jun. 27, 1984, 59-133494; Sep. 22, 1984, 59-198886; Feb. 19, 1985, 60-30722

Int. Cl.[4] C08K 3/40

U.S. Cl. 523—213 12 Claims

1. An epoxy resin powder coating composition comprising an epoxy resin with at least a hardener and a filler added thereto, wherein the filler is a mixture of from 30 to 180 parts by weight per 100 parts by weight of the epoxy resin of a needle-like glass powder having an average length of at least 40 μm and an aspect ratio of at least 4:1, and at least 30 parts by weight per 100 parts by weight of the epoxy resin of a granular inorganic filler having an average particle diameter of 1.0 μm or less and wherein the needle-like glass powder is surface treated with aminosilane, epoxysilane, or mercaptolsilane, and the granular inorganic filler is subjected to surface treatment to increase its affinity to the epoxy resin.

4,639,477

PROCESS FOR COLORING HIGH-MOLECULAR ORGANIC MATERIAL, AND NOVEL METAL COMPLEXES OF OXIME(S) OF O-HYDROXY BENZALDEHYDE(S) AND KETONE(S)

Georg Cseh, Posat, and Paul Lienhard, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

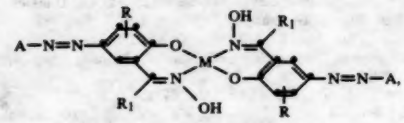
Filed Jun. 13, 1985, Ser. No. 745,033

Claims priority, application Switzerland, Jun. 15, 1984, 2914/84

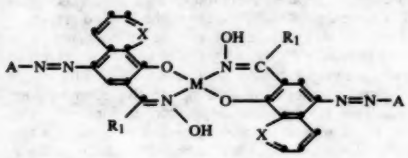
Int. Cl.[4] C08K 5/23; C09B 45/00, 56/02

U.S. Cl. 524—83 3 Claims

1. Mass-colored high-molecular weight synthetic or natural organic material having incorporated therein a compound of formula I, a compound of formula Ia or a mixture thereof



(I)



(Ia)

in which

A is a phenyl radical which is unsubstituted or substituted by halogen, phenyl, phenylazo, carboxyl, $-CF_3$, $-NO_2$, $-CN$, C_1–C_4-alkyl, C_1–C_4-alkoxy, $-CONH_2$, $-SO_2NH_2$, $-CONHR_2$, $-COOR_3$, $-NHCOR_4$ or $-SO_2NHR_2$, where R_2 is C_1–C_4-alkyl or phenyl which is unsubstituted or substituted by halogen, $-CF_3$, $-C_1$–C_4-alkyl, C_1–C_4-alkoxy, $-NO_2$, $-CN$, $-CONH_2$, $-SO_2NH_2$, $-CONHC_1$–C_4-alkyl, $-CONHC_6H_5$, C_2–C_5-alkoxycarbonyl, C_2–C_5-N-alkylcarbamoyl, $-NHCOC_6H_5$, $-SO_2NH-C_1$–C_4-alkyl or $-SO_2NHC_6H_5$, R_3 is C_1–C_4-alkyl, benzyl which is unsubstituted or substituted by halogen or C_1–C_4-alkyl, or phenyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_2–C_5-alkoxycarbonyl or C_2–C_5-N-alkylcarbamoyl, and R_4 is C_1–C_4-alkyl or phenyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, $-NO_2$ or C_2–C_5-N-alkylcarbamoyl, and A is also a naphthyl radical which is unsubstituted or substituted by halogen or $-CH_3$, an anthraquinonyl radical which is unsubstituted or substituted by halogen, $-NO_2$, $-CH_3$, OCH_3, $-NHCOCH_3$ or $-NHCOC_6H_5$, or a heterocyclic aromatic radical which is unsubstituted or substituted by —CL, $-CH_3$ or $-OCH_3$, R is —H, —Cl, $-CH_3$or $-OCH_3$, R_1 is —H, C_1–C_4-alkyl or phenyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, $-NO_2$, $-CONH_2$, $-CONHR_2$, or C_2–C_5-N-alkylcarbamoyl, X is —CH= or —N=, and M is a divalent transition metal, which is copper, nickel, cobalt or zinc.

4,639,478

BISMORPHOLINES, A PROCESS FOR THEIR PREPARATION AND THEIR USE FOR PROTECTION AGAINST HYDROLYSIS

Peter Haas, Haan; James M. Barnes, Wermelskirchen, and Wilhelm Goyert, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 640,907, Aug. 15, 1984. This application Apr. 29, 1986, Ser. No. 857,014

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331436

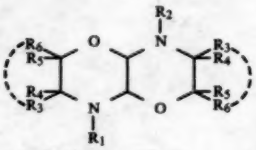
Int. Cl.[4] C08K 5/15

U.S. Cl. 524—97 12 Claims

1. A composition containing hydrolysis protective agents which comprises

(a) a synthetic polymer containing ester groups and/or carbonate groups and

(b) a quantity of about 0.1 to 10% by weight, based on the weight of component (a), of a 2,3,2',3'-bismorpholine derivative corresponding to the formula



wherein

R_1 and R_2 may be identical or different and represent alkyl, alkenyl, cycloalkyl or aryl substituents,

R_3, R_4, R_5 and R_6 represent hydrogen, alkyl, alkenyl, cycloalkyl and/or aryl substituents, or a cycloalkylene or arylene substituent formed by linkage of R_3 and R_6 with the proviso that R_4 and R_5 are omitted in the case of arylene,

and wherein the cycloalkyl or aryl groups of R_1, R_2, R_3, R_4, R_5 or R_6 may optionally contain inert substituents comprising a member selected from the group consisting of C_1–C_7-alkyl, chlorine or bromine.

4,639,479

POLYALKYLENEPOLYAMINE HAVING PENDANT SUBSTITUTED OXO-PIPERAZINYLTRIAZINES AND UV LIGHT STABILIZED COMPOSITIONS

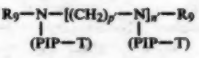
John T. Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 664,901, Oct. 26, 1984, Pat. No. 4,547,538, which is a continuation-in-part of Ser. No. 350,536, Feb. 2, 1982, Pat. No. 4,480,092. This application Sep. 20, 1985, Ser. No. 777,999

Int. Cl.[4] C08K 5/34; C07D 251/70, 251/52, 401/14

U.S. Cl. 524—100 6 Claims

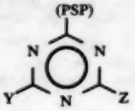
1. A class of compounds comprising acyclic polyalkylenepolyamines ("PAPA") having a pendant substituent at each N atom to form a PAPA with a pendant triazine nucleus at each nitrogen atom to form a pendant piperazinone-triazine ("P[PIP-T]") having the structure



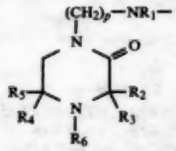
wherein

p' is an integer in the range from 2 to 8; R_9 represents H, C_1–C_{24} alkyl, C_4–C_7 cycloalkyl; C_1–C_{12} cyanoalkyl or hydroxyalkyl, and phenyl;

n' is an integer in the range from 2 to 12; (PIP-T) is represented by the residue of



wherein, PSP is a substituent having the formula



wherein,

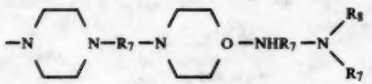
R_1 represents alkyl having 1 to about 24 carbon atoms (C_1–C_{24}), C_5–C_7 cycloalkyl, C_7–C_{20} aralkyl, C_1–C_{24} azaalkyl, and C_6–C_{20} azacycloalkyl;

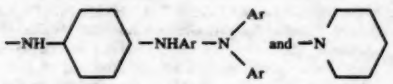
R_2, R_3, R_4 and R_5 independently represent C_1–C_{24} alkyl, and C_4–C_7 polymethylene which are cyclizable forming a spiro cycloalkylene substituent with the C atom of the piperazinone ring;

R_6 represents hydrogen or oxygen, C_1–C_{24} alkyl, C_1–C_{12} hydroxyalkyl, benzyl, allyl, and C_1–C_{12} haloalkyl;

Y may be the same as (PSP) or Z;

Z represents a radical selected from the group consisting of Cl, OH,





R_7 and R_8 represent C_2–C_{24} alkyl;

Ar represents aryl;

p represents an integer in the range from 2 to 20;

and, Y and Z may be the same, or the same as X provided one of the substituents furnishes a leaving group.

4,639,480

POLYESTER COMPOSITIONS CONTAINING A PHTHALIMIDE

Gail H. Birum, Kirkwood; Thomas C. Mathis, St. Louis, and Richard D. Stolk, Manchester, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 17, 1985, Ser. No. 736,004

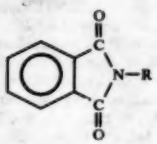
Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—104 **13 Claims**

1. A polyester molding composition, comprising:

(a) from about 40 to about 95 parts by weight of a polyethylene terephthalate having an intrinsic viscosity of at least 0.4 deciliter/gram measured as a 0.5% by weight solution in a 60:40 mixture of phenol and tetrachloroethane at 25° C.; and

(b) from about 0.5 to about 15 parts by weight of a plasticizer comprising a phthalimide, of the formula:



where R is alkyl, alkenyl, or alkoxy alkyl with from 12 to 30 carbon atoms.

4,639,481

MODIFIED THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS AND ARTICLES MOLDED THEREFROM

Harold F. Giles, Jr., Cheshire, Mass., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 424,266, Sep. 27, 1982, abandoned. This application Apr. 9, 1985, Ser. No. 721,340

Int. Cl.[4] C08L *69/00*

U.S. Cl. 524—128 **8 Claims**

1. A thermoplastic molding composition comprising:

(a) from about 15 to about 49 parts by weight of poly(C_{2-6} alkylene terephthalate) resin;

(b) from about 51 to about 80 parts by weight of an aromatic polycarbonate resin; and

(c) from about 5 to about 20 parts by weight of a polyolefin copolymer consisting of ethylene and propylene reaction products or ethylene, propylene and diene reaction products.

7. A composition according to claim 1, which includes from about 0.01 to about 0.5 percent by weight of an organic phosphite.

4,639,482

PHOSPHORIC ACID COMPOUNDS AS CO-STABILIZERS FOR ME(II)-CARBOXYLATES AND/OR ME(II)-PHENOLATES IN PVC

Horst Müller, Fürth/Odenwald; Horst Zinke, Ernsthofen, and Wolfgang Wehner, Zwingenberg, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,183

Claims priority, application Switzerland, Mar. 25, 1982, 1842/82; Nov. 30, 1982, 6949/82

Int. Cl.[4] C08K *5/52*

U.S. Cl. 524—137 **7 Claims**

1. A stabilized composition comprising polyvinyl chloride and a stabilizer mixture comprising at least one compound of the formula I

$$[ROOC—C_nH_{2n}S—]_3\,PX \qquad (I)$$

wherein X is O or S, n is an integer from 1 to 5, and R is straight-chain or branched-chain C_1–C_{18}-alkyl or substituted or unsubstituted cyclohexyl, and at least one polyvinyl chloride stabilizer of the type Me(II)-carboxylate and/or Me(II)-phenolate, where Me(II) denotes one or more metals from the series: Ba, Sr, Ca, Mg, Zn and Cd, and wherein there are used, relative to the polyvinyl chloride, 0.01–2 percent by weight of the compound of the formula I and 0.1–4 percent by weight of the Me(II)-carboxylate and/or Me(II)-phenolate.

4,639,483

SOAP-THICKENED REENTERABLE GELLED ENCAPSULANTS

James E. Billigmeier, St. Paul, Minn.; James D. Groves, Hudson, Wis.; Harwick A. Haugen, Roseville, and Richard J. Pokorny, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1985, Ser. No. 732,423
Int. Cl.[4] C08K 5/09
U.S. Cl. 524—296 24 Claims

1. A composition of matter consisting essentially of a mixture of:

(a) 35 to 90 parts by weight of a plasticizer that does not stress-crack polycarbonate, said plasticizer being a naphthenic or paraffinic oil having an aromatic content of less than 15 weight percent, a paraffinic content of 85 to 100 percent, and a specific gravity in the range of 0.80 to 1.00,

(b) 9 to 20 parts by weight of an aliphatic or aromatic carboxylic acid having 18 to 100 carbon atoms,

(c) 2 to 20 parts by weight of a basic oxide or hydroxide, and

(d) an effective amount up to 10 parts by weight of an elastomer which is soluble in said composition and having a solubility parameter of 7 to 9, and

(e) optionally, an effective amount up to 30 parts by weight of at least one of thickening agents, flow point elevators, antioxidants, fungicides, and flame retardants.

4,639,484

MOLD RELEASE ENHANCEMENT FOR ACRYLONITRILE-BUTADIENE-STYRENE MOLDING RESINS

Kim S. Percell, Memphis, Tenn., assignor to Witco Chemical Corporation, New York, N.Y.

Filed Mar. 25, 1986, Ser. No. 843,719
Int. Cl.[4] C08J 3/10
U.S. Cl. 524—318 18 Claims

1. A thermoplastic molding composition, comprising a thermoplastic acrylonitrile-butadiene-styrene resin and a mold release force reduction effective amount of a mold release agent ester selected from the group consisting of cetyl palmitate, cetyl stearate and blends of cetyl palmitate and cetyl stearate.

4,639,485

CO-SOLVENT ACCELERATOR FOR CONVERSION OF POLYAMIDE-ACID SOLUTION TO POLYIMIDE

Paul D. Frayer, Brooklyn, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Jul. 31, 1985, Ser. No. 760,899
Int. Cl.[4] C08J 3/02; C08K 5/04
U.S. Cl. 524—378 6 Claims

1. A co-solvent for a polyimide-acid ether solution for accelerating the conversion of said solution to polyimide and permitting rapid removal of the ether solvent, said co-solvent comprising:

polyamide-acid solution;

ether solvent; and

a pyrrolidone based polar aprotic solvent, wherein said ether solvent and said pyrrolidone based polar aprotic solvent form a co-solvent mixture with said polyamide-acid solution whereby the conversion of said polyamide-acid to polyimide is accelerated along with rapid removal of ether solvent from said polyamide-acid solution.

4,639,486

FLAME RETARDANT ELASTOMERIC COMPOSITIONS

Nan-I Liu, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 8, 1985, Ser. No. 785,642
Int. Cl.[4] C08G 73/10
U.S. Cl. 524—409 29 Claims

1. A flame retardant thermoplastic composition comprising (A)(i) one or more thermoplastic elastomeric polymers characterized as having ether, ester and imide linkages and wherein the ether linkages are present as a high molecular weight, i.e. MW of from about 400 to about 12000, polyoxyalkylene or copolyoxyalkylene units derived from long chain ether glycols or long chain ether diamines, alone or in combination with (ii) one or more modifying resins,

(B) a flame retarding amount of a halogenated flame retarding material,

(C) optionally, an effective amount of an organic or inorganic flame retardant synergist compound, and

(D) optionally, an effective amount of an organic or inorganic drip suppressant material.

4,639,487

HEAT SHRINKABLE THERMOPLASTIC OLEFIN COMPOSITION

Donald R. Hazelton, Chatham, and Robert C. Puydak, Cranbury, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 11, 1984, Ser. No. 629,634
Int. Cl.[4] C08J 3/24; C08L 23/26, 15/02, 33/04
U.S. Cl. 524—425 33 Claims

1. A heat shrinkable, thermoplastic elastomeric composition comprising a polyolefin resin wherein the polyolefin resin comprises an ethylene copolymer resin and a butyl or halogenated butyl rubber wherein at least a part of the rubber is dynamically vulcanized to a fully cured state in the presence of the polyolefin resin except that the use of peroxide cure systems are specifically excluded and wherein said ethylene copolymer resin is selected from the group consisting of copolymers of ethylene and vinyl acetate, copolymers of ethylene with an alkyl ester of an alpha, beta monoethylenically unsaturated monocarboxylic acid and copolymers of ethylene with said acid.

4,639,488

IMPACT-RESISTANT POLYOXYMETHYLENE MOLDING MATERIALS AND THEIR PREPARATION

Wilhelm Schutte, Speyer; Graham Edmund McKee, Weinheim; Albrecht Hilt, Limburgerhof; Gerhard Heinz, Weisenheim, and Heiner Goerrissen, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 5, 1985, Ser. No. 795,128
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 3441547
Int. Cl.[4] C08L 51/00
U.S. Cl. 524—456 7 Claims

1. An impact-resistant polyoxymethylene molding material containing

(A) from 30 to 95% by weight of one or more polyoxymethylenes and

(B) from 5 to 70% by weight of one or more elastomeric graft polymers which are prepared by emulsion polymerization, are dispersed in component A, have a mean particle diameter of from 0.08 to 2 μm and are composed of

1. from 60 to 90% by weight of a grafting base of crosslinked polybutadiene in which not more than 30% by weight of the butadiene may be replaced by one or more of isoprene, 2,3-dimethylbutadiene, styrene, p-methylstyrene, α-methylstyrene and (meth)acrylonitrile, and

2. from 10 to 40% by weight of one or more grafted shells consisting of polymers of styrene, methyl methacrylate or mixtures thereof which not more than 30% by weight of the said monomers 2 may be replaced with acrylonitrile or a C_1–C_8-alkyl acrylate,

the percentages A and B and the percentages 1 and 2 summing to 100,

4,639,489

METHOD OF PRODUCING A SILICONE DEFOAMER COMPOSITION

Koichi Aizawa; Shingo Sewa, and Hideki Nakahara, all of Kanagawa, Japan, assignors to Dow Corning Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,922
Claims priority, application Japan, May 30, 1984, 59-108450
Int. Cl.[4] C08K 3/36
U.S. Cl. 524—588 18 Claims

1. A method of producing a silicone defoamer composition comprising reacting at a temperature of 50° C. to 300° C.:

(1) 0 to 100 parts by weight of a polyorganosiloxane having a viscosity of 20 to 100,000 cs at 25° C. and being expressed by the general formula $R_a^1SiO_{(4-a)/2}$ in which R^1 is a monovalent hydrocarbon or halogenated hydrocarbon group having 1 to 10 carbon atoms and a has an average value of from 1.9 to 2.2;

(2) 5 to 100 parts by weight of a polyorganosilxoane having a viscosity of 200 to several million cs at 25° C. expressed by the general formula $R_b^2(R^3O)_cSiO_{(4-b-c)/2}$ in which R^2 is a monovalent hydrocarbon or halogenated hydrocarbon group having 1 to 10 carbon atoms, R^3 is hydrogen or a monovalent hydrocarbon group having 1 to 10 carbon atoms, b has an average value of from 1.9 to 2.2 and c has a sufficiently large value to give at least one —OR^3 group in each molecule, said —OR^3 group being present at least at the end of a molecular chain;

(3) 0.5 to 20 parts by weight for every 100 parts by weight of said components (1) and (2) of one or more compounds selected from the following (a) to (d):

(a) an organosilicon compound of the general formula $R_d^4SiX_{4-d}$ in which R^4 is a monovalent hydrocarbon group having 1 to 5 carbon atoms, X is a hydrolyzable group and d has an average value of one or less;

(b) a partially hydrolyzed condensate of said compound (a);

(c) a siloxane resin consisting essentially of $(CH_3)_3SiO_{1/2}$ and SiO_2 units and having a $(CH_3)_3SiO_{1/2}/SiO_2$ ratio of 0.4/1 to 1.2/1; and

(d) a condensate of said compound (c) with said compound (a) or (b);

(4) 0.5 to 30 parts by weight of a finely divided filler for every 100 parts by weight of said components (1) and (2);

(5) a catalytic amount of a compound for promoting the reaction of the other components; and

(6) 0 to 20 parts by weight, for every 100 parts by weight of said components (1) and (2), of a polyorganosiloxane having a viscosity of 5 to 200 cs at 25° C. and being expressed by the general formula $R_e^8(R^9O)_fSiO_{(4-e-f)/2}$ in which R^8 is a monovalent hydrocarbon or halogenated hydrocarbon group having 1 to 10 carbon atoms, R^9 is hydrogen or a monovalent hydrocarbon group having 1 to 10 carbon atoms, e is from 1.9 to 2.2 on an average and f has a sufficiently large value to give at least two —OR^9 groups in each molecule at the end of a molecular chain.

4,639,490

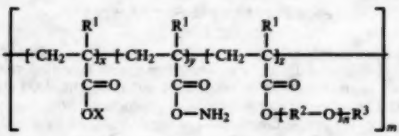
PROCESS FOR PREPARING NOVEL COPOLYMER

William F. Masler, III, Hinckley, and Zahid Amjad, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 685,279, Dec. 24, 1984, Pat. No. 4,566,974, which is a division of Ser. No. 508,636, Jun. 28, 1983, Pat. No. 4,499,002. This application Jan. 27, 1986, Ser. No. 822,705
Int. Cl.[4] C08K 5/05
U.S. Cl. 524—765 3 Claims

1. A method for forming a copolymer of (i) acrylic acid or methacrylic acid, (ii) acrylamide or methacrylamide, and (iii) and alkoxyalkyl (meth)acrylate ester comprising,

reacting preselected amounts of each of the foregoing in the presence of an effective amount of an initiator and a solvent selected from a primary alcohol and a mixture of a primary alcohol with water, at a temperature in the range from about 30° C. to the reflux temperature of the solution, so as to form an alcoholic solution of a random copolymer having the structural formula



wherein,

X represents H, or NH_4, or an alkali metal selected from the group consisting of sodium and potassium;

R^1 represents H, or methyl;

R^2 represents lower alkyl having from 2 to about 4 carbon atoms;

R^3 represents lower alkyl having from 1 to about 10 carbon atoms;

n is an integer in the range from 2 to about 6;

m is an integer in the range from about 3 to about 70; and,

for each y (that is, y=1) x is an integer in the range from about 1 to about 8, and z is a number in the range from 1 to about 0.075; and x, y and z are present in relative heterogeneous order, said copolymer being present in the solution in an amount in excess of 90% by weight of polymer formed.

4,639,491

DISPERSION STABILIZER FOR WATER-IN-OIL SUSPENSION POLYMERIZATION

Akihiro Kondo; Rikio Tsushima, and Yuzo Sumida, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 12, 1985, Ser. No. 808,415
Claims priority, application Japan, Dec. 28, 1984, 59-276416
Int. Cl.[4] C08F 2/32
U.S. Cl. 524—801 7 Claims

1. A process for preparing a polymer by water-in-oil suspension polymerization, which comprises:

preparing an oil composition comprised of a water-insoluble, non-polar, organic solvent and a dispersant polymer, said dispersant polymer consisting esentially of from 70 to 99 mole percent of lipophilic, ethylenically unsaturated monomer units and from 1 to 30 mole percent of ethylenically unsaturated monomer units having a cationic group,

separately preparing an aqueous solution of a polymerization initiator and at least one water-soluble, ethylenically unsaturated monomer,

and then mixing said aqueous solution with said oil composition and maintaining the mixture thereof under water-in-oil suspension polymerization conditions effective to polymerize said water-soluble, ethylenically unsaturated monomer.

4,639,492

PHENOLIC-MODIFIED ROSIN ESTERS

Joseph M. Makhlouf, Mars; Frederick A. Falk, Pittsburgh, and Robert M. Piccirilli, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 9, 1985, Ser. No. 764,028
Int. Cl.[4] C09F 1/04, 7/08
U.S. Cl. 525—54.42 24 Claims

1. A phenolic-modified rosin ester comprising:

(a) a rosin esterification product of:

(i) an acid functional reactant comprising a rosin polyacid containing a dimerized rosin, and

(ii) an alcohol; reacted with

(b) a phenolic resin.

4,639,493

CONJUGATED DIENE FUNCTIONAL MODIFIED AMINOEPOXY RESINS

Ray A. Dickie, Birmingham, and Saiyed B. A. Qaderi, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 10, 1984, Ser. No. 679,977
Int. Cl.[4] C08L 63/10
U.S. Cl. 525—113 19 Claims

1. A substantially gel-free diene functional modified aminoepoxy resin of number average molecular weight (Mn) about 1000–18,000, comprising the reaction product of (i) diepoxide reactant, (ii) amine functional conjugated diene chain extending reactant selected from the group consisting of di-secondary amine functional bis-diene, mono-primary amine functional diene, and a mixture of any of them, (iii) modifying agent comprising hydroxy functional secondary amine, and (iv) second modifying agent selected from the group consisting of secondary amine terminated. butadiene acrylonitrile copolymer resin, carboxy terminated butadiene acrylonitrile copolymer resin, and any mixture thereof, said second modifying agent having number average molecular weight about 1400–4400 and amine or carboxy, respectively, equivalent weight of about 700–2200.

4,639,494

PROCESS FOR PRODUCING POLYSTYRENE

Akio Imai, Ichihara; Yasushi Okamoto, Ibaraki, and Masatoshi Saito, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 25, 1985, Ser. No. 704,856
Claims priority, application Japan, Feb. 28, 1984, 59-37490
Int. Cl.[4] C08F 4/08, 279/00
U.S. Cl. 525—271 13 Claims

1. In a process for producing a high impact polystyrene comprising radical polymerization of styrene in the presence of a butadiene rubber, the improvement which comprises the butadiene rubber being a highly branched polymer prepared by homopolymerizing 1,3-butadiene or copolymerizing 1,3-butadiene with styrene in the presence of an organomonolithium compound and a Lewis base compound, followed by further reacting the resulting polymer with at least one multifunctional halogen compound selected from the group consisting of silicon tetrachloride, tin tetrachloride and germanium tetrachloride; in the butadiene rubber, the average content of 1,2-bonds being 18 to 32 mole % based on the total bonded butadiene, the content of bonded styrene being up to 10% by weight, and the content of branched polymer chains being at least 60% by weight; the butadiene rubber exhibiting a Mooney viscosity of 40 to 90 at 100° C. and a solution viscosity in styrene of 60 to 90 cps at 25° C. and at a concentration of 5% by weight, and the ratio of the solution viscosity (SV) to the Mooney viscosity (ML) being $0.7 \leqq SV/ML \leqq 1.28$; and the styrene polymerization being carried out so that the content of the butadiene rubber in the product polystyrene lies between 3 and 20% by weight.

4,639,495

EXTRUDING PROCESS FOR PREPARING FUNCTIONALIZED POLYOLEFIN POLYMERS

Marion G. Waggoner, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 333,177, Dec. 21, 1981, abandoned.
This application Apr. 14, 1983, Ser. No. 485,005
Int. Cl.[4] C08F 255/02
U.S. Cl. 525—285 4 Claims

1. A process for the preparation of functionalized polyolefin polymers comprising:

(i) concurrently heating to 200°–350° C. and homogeneously mixing a blend of a polyolefin having 2 to 8 carbon atoms, said polyolefin being at a temperature below its melting point prior to said heating, 0.1 to 10 weight percent of an α,β ethylenically unsaturated monomer and 0.05 to 2.0 weight percent of an organic peroxide initiator in an intensive mixing zone of an extruder for a time sufficient to graft the monomer onto the polyolefin such that 0.1 to 3.0 weight percent of the grafted polyolefin consists of the monomers;

(ii) passing the mixture into a reduced pressure zone as compared to the intensive mixing zone and removing any excess monomer therefrom; and

(iii) passing the mixture through the remainder of the extruder.

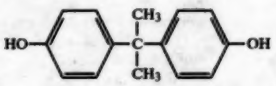
4,639,496

METHOD FOR THE MANUFACTURE OF A POLYMER REACTED WITH $FECL_3$

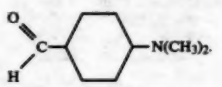
Gerd Weddigen; Robert Huber, both of Heidelberg; Birgit Schmidt, Ludwigshafen, and Hartmut Schneider, Plankstadt, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Division of Ser. No. 563,871, Dec. 21, 1983, Pat. No. 4,564,466.
This application Aug. 29, 1985, Ser. No. 770,701
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248088
Int. Cl.[4] C08G 8/28
U.S. Cl. 525—506 1 Claim

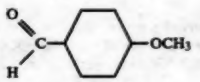
1. Method for the production of a synthetic polymer with triaromatic methane units as basic building blocks having an electric conductivity through formation of charge transfer complexes, said polymer selected from the group consisting of a polymer formed by polycondensation of bisphenol-A,



and 4-dimethylaminobenzaldehyde



by polycondensation of bisphenol-A and para-anisaldehyde



and by polycondensation of benzaldehyde and resorcinol, which comprises adding 10 to 50% by weight ferric chloride relative to the total weight of the polymer as an electron acceptor and reacting the ferric chloride with the polymer to form charge transfer complexes and produce a fusible and soluble polymer with an electric bulk conductivity within a range from 2×10^{-15} to 3×10^{-4} $(ohm \times cm)^{-1}$.

4,639,497

PREPARATION OF TETRAFLUOROETHYLENE FINE POWDER

Alan C. Knight, and Satish C. Malhotra, both of Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 28, 1985, Ser. No. 770,259
Int. Cl.[4] C08F 114/26
U.S. Cl. 526—93 5 Claims

1. A process for polymerizing tetrafluoroethylene in an aqueous medium in the presence of a substantially non-telogenic anionic surfactant present in an amount which maintains colloidal particles of polymerization product in dispersed form, said process being carried out by contacting tetrafluoroethylene in said aqueous medium in the presence of a redox polymerization initiator system defined as a mixture of

(i) manganese triacetate oxidizing agent, and

(ii) a substantially non-telogenic reducing agent and wherein the redox initiator components are added such that the last portion of the polymerization is slowed down by stopping addition of such components so that the end point of the reaction is at least 10% longer than if addition of such component is continued to the end of the polymerization.

4,639,498

AEROBICALLY HARDENABLE PLASTIC COMPOSITIONS

Wolfgang Ritter, Düsseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 407,887, Aug. 13, 1982, abandoned. This application May 29, 1985, Ser. No. 739,484
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1982, 3201731
Int. Cl.[4] C08F 4/52
U.S. Cl. 526—196 27 Claims

1. An aerobically hardenable plastic composition comprising

(a) a component containing polymerizable ethylenic double bonds, and

(b) an organo-boron compound having a boron-free polymer matrix with at least one organic polymer chain to which are attached, as side chains by hydroboration of ethylenic double bonds, boron-containing groups of the structure R_1R_2B— in which R_1 is a hydrocarbon radical having up to 25 carbon atoms and R_2 is either hydrogen, a hydrocarbon radical having up to 25 carbon atoms, or together with R_1 forms a cyclic hydrocarbon radical having up to 25 carbon atoms, each end of which is bound to the boron atom with a boron-carbon bond, said boron-free polymer matrix being largely inert to atmospheric oxygen and having an iodine number of from about 1 to about 500 before hydroboration.

4,639,499

CROSS-LINKABLE POLYMER RESINS AND USE THEREOF AS BINDERS FOR COATING AGENTS

Peter Höhlein, Kempen; Manfred Schmidt, Dormagen; Josef Pedain; Bernd Riberi, both of Cologne, and Michael Sonntag, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 18, 1985, Ser. No. 756,483
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427385
Int. Cl.[4] C08F 238/00, 220/04
U.S. Cl. 526—285 3 Claims

1. A cross-linkable, hydroxyl group-containing polymer resin which is suitable as a lacquer binder and produced by copolymerizing olefinically-unsaturated monomers, said polymer resin having an hydroxyl number of about 20 to 400, an average osmometrically-determined molecular weight of about 500 to 30,000 and a molecular inhomogeneity U of about 0.5 to 40, wherein said polymer resin contains about 0.2 to 80% by weight, based on the weight of said polymer resin, of incorporated monomers selected form the group consisting of olefinically-unsaturated aliphatic diols having 4 carbon atoms; acetylenically-unsaturated aliphatic diols having 4 carbon atoms; the ether group-containing alkoxylation products of said olefinically-unsaturated aliphatic diols having 4 carbon atoms, said ether groups-containing alkoxylation products having a hydroxyl number of about 50 to 900; the ether group-containing alkoxylation products of said acetylenically-unsaturated aliphatic diols having 4 carbon atoms, said ether group-containing alkoxylation products having a hydroxyl number of about 50 to 900; the reaction products of said olefinically-unsaturated aliphatic diols having 4 carbon atoms with ϵ-caprolactone in a mole ratio of said olefinically-unsaturated aliphatic diols having 4 carbon atoms to ϵ-caprolactone of about 1:0.2 to 1:10; the reaction products of said acetylenically-unsaturated aliphatic diols having 4 carbon atoms with ϵ-caprolactone in a mole ratio of said acetylenically-unsaturated aliphatic diols having 4 carbon atoms to ϵ-caprolactone of about 1:0.2 to 1:10; and mixtures thereof.

4,639,500

RESIN COMPOSITIONS CURABLE BY ACTIVE ENERGY RAYS

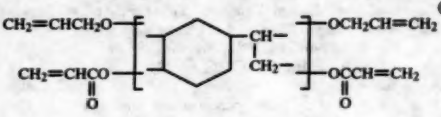
Motonobu Kubo, Iwakuni, Japan, assignor to Sanyo-Kokusaku Pulp Company, Limited, Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,269
Claims priority, application Japan, Feb. 3, 1984, 59-19107
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] C08F 2/50, 20/28, 20/40
U.S. Cl. 526—301 4 Claims

1. A resin composition curable by active energy rays which comprises:

(A) A base resin having a polymerizable ethylenic unsaturated group; and

(B) A reactive diluent having the formula (I):



(I)

4,639,501

METHOD FOR FORMING NEW PRECERAMIC POLYMERS CONTAINING SILICON

Dietmar Seyferth, Lexington, Mass., and Yuan-Fu Yu, Dayton, Ohio, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 4, 1985, Ser. No. 772,375
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—15 42 Claims

1. A method for preparing preceramic organosilicon polymers, wherein the method comprises:

(a) mixing an organopolysilane of the formula $[(RSiH)_x(RSi)_y]_n$ with a sufficient quantity to undergo a hydrosilylation reaction of an organosilicon compound containing at least two alkenyl groups or a cyclic organic compound containing at least three alkenyl groups where $x+6=1$, $0<x<1$, $0<y<1$, R is a lower alkyl group having from 1 to about 6 carbon atoms, a substituted or unsubstituted cycloalkyl group having 3 to about 6 carbon atoms, or a substituted or unsubstituted lower aryl group having from 6 to 10 carbon atoms, and n is an integer greater than 1, and

(b) allowing the mixture of step (a) to react, neat or in an organic solvent, thereby forming said preceramic organosilicon polymer.

4,639,502

SUBSTANTIALLY COLORLESS ORGANIC POLYISOCYANATES, PROCESSES FOR THEIR PRODUCTION AND THEIR USE IN THE PRODUCTION OF POLYURETHANE PLASTICS

Hanns P. Müller, Odenthal; Werner Clarenz, Leverkusen; Ulrich von Gizycki, Leverkusen, and Kuno Wagner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,134

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416896

Int. Cl.[4] C08G 18/80, 18/79

U.S. Cl. 528—45 11 Claims

1. A substantially colorless organic polyisocyanate, optionally in solution in an inert solvent, having a Hazen color index according to DIN 53 409 of at most 60 and a yellow value according to DIN 6167 of at most 3.0, which contains about 0.01 to 1 ppm (by weight), based on polyisocyanate, of an organic dye soluble in the polyisocyanate and having an absorption maximum of about 560 to 590 nm or of a mixture of said dyes.

3. A process for producing a substantially colorless organic polyisocyanate which comprises mixing a polyisocyanate, optionally dissolved in an inert solvent, with about 0.01 to 1 ppm, based on polyisocyanate, of an organic dye soluble in the polyisocyanate and having an absorption maximum of about 560 to 590 nm or of a mixture of said dyes.

6. A process for the production of polyisocyanate polyaddition products which comprises reacting

(a) the polyisocyanate of claim 1 with

(b) an isocyanate-reactive compound.

8. The process of claim 6 wherein said polyisocyanate is blocked with a blocking agent for isocyanate groups.

4,639,503

THERMOSETTING RESIN COMPOSITION

Hajime Hara, Fujisawa; Shingo Orii; Kazuho Aoyama, both of Kawasaki, and Masami Enomoto, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,426

Int. Cl.[4] C08G 59/62

U.S. Cl. 528—92 1 Claim

1. A thermosetting resin composition comprising as the essential components;

(1) 100 weight parts of a curable epoxy resin; and

(2) 30 to 300 weight parts of a phenol adduct of a conjugated diolefin polymer prepared by the addition reaction of a phenol compound with a member selected from the group consisting of a conjugated diolefin homopolymer having a number-average molecular weight of 300 to 10,000 and a conjugated diolefin copolymer containing at least 50 mol % of conjugated diolefin monomer units and having the same molecular weight as above in the presence of aluminum phenoxide as the catalyst.

4,639,504

PRODUCTION OF THERMALLY STABILIZED AROMATIC POLYESTERS

Steve G. Cottis, Fort Wright, Ky., assignor to Dart Industries Inc., Northbrook, Ill.

Continuation of Ser. No. 386,452, Jun. 8, 1982, abandoned. This application May 16, 1985, Ser. No. 734,953

Int. Cl.[4] C08G 63/60

U.S. Cl. 528—176 25 Claims

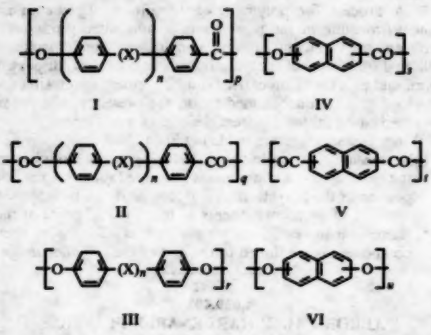
1. A bulk polymerization process for preparing a thermally stable wholly aromatic polyester comprising:

heat condensing wholly aromatic precursors to form a prepolymer;

incorporating into the reaction mixture a phosphite compound, after substantial formation of the prepolymer and before advancing the prepolymer, in an amount of between about 0.05 to 0.5 parts per hundred by weight; and

advancing the prepolymer to form a thermally stable wholly aromatic polyester having the required degree of polymerization.

9. The process of claim 1 wherein the polyester comprises recurrent moieties selected from the following formulas:



where X is O, S, CO, NH, or SO_2; n is zero or one; and p+q+r+s+t+u is about 3 to 800.

4,639,505

POLY (ETHER AMIDE) COMPOSITION FROM REACTION OF BIS BICYCLIC AMIDE ACETAL WITH BIS- OR POLY-PHENOLIC MATERIAL

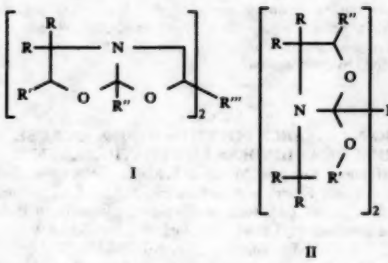
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 7, 1985, Ser. No. 763,106

Int. Cl.[4] C08G 67/00

U.S. Cl. 528—211 5 Claims

1. The process for preparing a polymer composition containing ether-amide groups comprising reacting a bis bicyclic amide acetal of Formula I or II



wherein R, R′ and R″ independently represent hydrogen, an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an arkaryl group having from 7 to 20 carbon atoms or a hydrocarbon ether group having from 1 to 20 carbon atoms and R‴ represents an alkylene group having from 1 to 20 carbon atoms, an arylene group having from 6 to 12 carbon atoms or an alkarylene group having from 7 to 20 carbon atoms, with a bis-phenolic or poly-phenolic compound at a temperature in the range of from about 80° C. to 200° C.

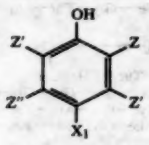
4,639,506

PROCESS FOR PREPARING POLYPHENYLENETHERS

Luigi Sacconi, Florence; Marco Foà ; Elena Bencini, both of Novara, and Giampiero Sabarino, Vercelli, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 9, 1985, Ser. No. 721,541
Claims priority, application Italy, Apr. 10, 1984, 20456 A/84
Int. Cl.[4] C08G 33/00
U.S. Cl. 528—212 6 Claims

1. A process for preparing polyphenylenethers by oxidative polymerization of phenols having the formula:



(II)

in which X_1 is an atom selected from the group consisting of hydrogen, chlorine, bromine and iodine; Z is a radical selected from the group consisting of hydrocarbyl and halohydrocarbyl radicals having at least two carbon atoms between the halogen atom and the aromatic nucleus, or Z is a radical selected from the group consisting of hydroxyalkyl and halohydroxyalkyl radicals having at least two carbon atoms between the halogen atom and the aromatic ring;

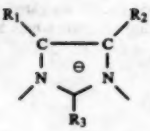
Z' and Z'' are the same as Z, or are halogen atoms, provided Z, Z' and Z'' do not have a tertiary carbon atom in position alpha with respect to the aromatic nucleus, which process is carried out with oxygen, in the presence of an aliphatic organic base, in at least prevailingly hydrocarbon medium, and of a catalyst consisting of a copper compound having the formula:

$$(B)_n(Cu)_aX_bY_z \qquad (I)$$

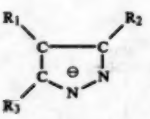
in which B is a naphthiridine group, with the two nitrogen atoms placed one in respect to the other in any possible relationship, or B is a naphthiridine group substituted by at least one substituent selected from the group consisting of alkyl, cycloalkyl, arylalkyl, aromatic groups, said substituents which are further substituted and contain from 1 to 10 carbon atoms, of alkoxy, phenoxy, haloid, dialkylaminic, carboxyl, ketonic, alkoxycarbonyl groups, nitro-groups, and amidic groups;

X is selected from the group consisting of chlorine or bromine, a nitro-group and a perchlorate group;

Y is an anionic compound bridging two copper atoms, having a heteroaromatic structure selected from pyrazole groups having the formula:



or imidazole groups having the formula



in which formulae: R_1, R_2, R_3 are selected from the group consisting of hydrogen, C_1–C_5 alkyl, cycloalkyl, arylalkyl, aryl and heterocyclic groups, or R_1 and R_2 together form an aromatic ring containing from 6 to 10 carbon atoms or a heteroaromatic ring containing 5 or 6 terms, condensed with the pyrazole or imidazole structure;

z is zero or 1, wherefore: when z is zero, a and n, like or unlike each other, are alternatively 1 or 2;

b is an integer from 1 to 3, while: when z is 1, n=a=2, and b=3.

4,639,507

PROCESS FOR THE ISOLATION OF POLYARYLENE SULPHIDE

Wolfgang Alewelt, Krefeld; Wolfgang Eisermann, Duesseldorf; Karl-Heinrich Meyer; Erhard Tresper, both of Krefeld, and Martin Ulrich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,645
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433978
Int. Cl.[4] C08G 75/14
U.S. Cl. 528—388 2 Claims

1. A process for the isolation of polyarylene sulphide from a crude reaction mixture which comprises removing water and other volatile materials by evaporation in a heated screw machine in less than one hour.

4,639,508

PROCESS FOR PRODUCING GRANULAR COMPOSITION OF ETHYLENETHIOUREA-CHLOROPRENE RUBBER

Yasuhiro Sakanaka, and Shuichi Okuzono, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Continuation of Ser. No. 199,056, Oct. 20, 1980, abandoned.
This application Apr. 30, 1984, Ser. No. 605,209
Claims priority, application Japan, Jan. 16, 1980, 55-2603
Int. Cl.[4] C08C 1/00; C08K 5/36
U.S. Cl. 528—486 5 Claims

1. A process for producing a granular composition of ethylenethiourea-chloroprene rubber which comprises adding drop-wise a mixture of chloroprene rubber latex and a 3–40 wt. % solution of ethylenethiourea in water at a rate of 5–100 wt. % per rubber component of said rubber latex and the macromolecular polyanion sodium alginate at a ratio of 2–8 wt. % per rubber of said rubber latex, at lower than 10° C. into an aqueous solution containing at least one alkaline earth metal salt at lower than 10° C. to form granules, separating the granules from the aqueous solution in which they are formed and then, dehydrating and drying the granules.

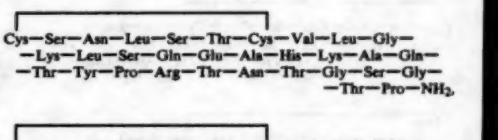
4,639,509

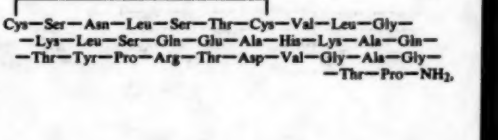
[16,19-DI-ALANINE] CALCITONIN

Ronald C. Orlowski, Frankfort, Ill.; Glenn L. Stahl, Manchester, Mo., and Robert L. Colescott, Bourbonnais, Ill., assignors to Armour Pharmaceutical Company, Tuckahoe, N.Y.

Filed Mar. 28, 1985, Ser. No. 717,216
Int. Cl.[4] C07K 7/36
U.S. Cl. 530—307 2 Claims

1. A peptide having the structure:





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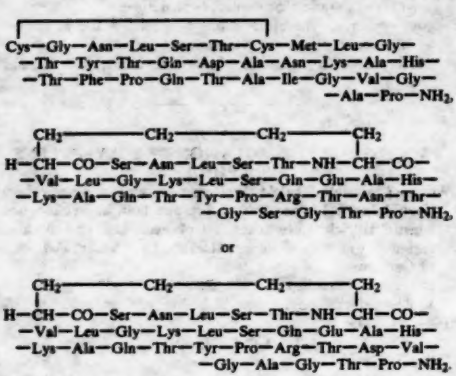


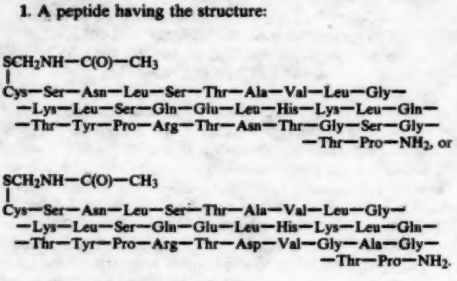
4,639,510

(1-S-ACETAMIDOMETHYL CYSTEINE, 7-ALANINE)CALCITONIN

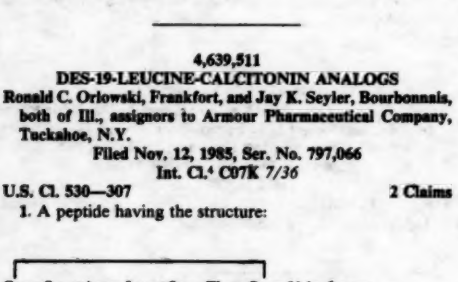
Ronald C. Orlowski, Frankfort; Jay K. Seyler, Bourbonnais, both of Ill., and Glenn L. Stahl, Manchester, Mo., assignors to Armour Pharmaceutical Company, Tuckahoe, N.Y.

Filed Oct. 4, 1985, Ser. No. 784,919
Int. Cl.[4] C07K 7/36
U.S. Cl. 530—307 1 Claim

1. A peptide having the structure:



or



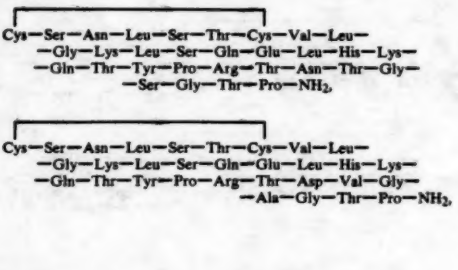
4,639,511

DES-19-LEUCINE-CALCITONIN ANALOGS

Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Company, Tuckahoe, N.Y.

Filed Nov. 12, 1985, Ser. No. 797,066
Int. Cl.[4] C07K 7/36
U.S. Cl. 530—307 2 Claims

1. A peptide having the structure:



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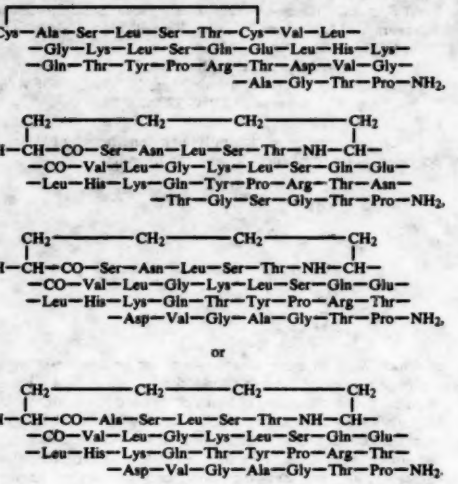
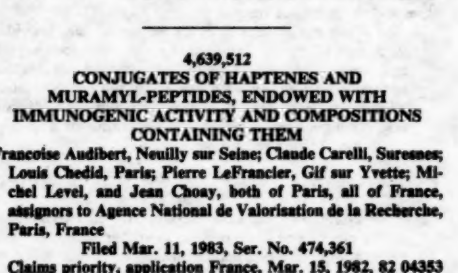


or



4,639,512

CONJUGATES OF HAPTENES AND MURAMYL-PEPTIDES, ENDOWED WITH IMMUNOGENIC ACTIVITY AND COMPOSITIONS CONTAINING THEM

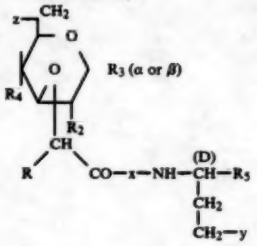
Francoise Audibert, Neuilly sur Seine; Claude Carelli, Suresnes; Louis Chedid, Paris; Pierre LeFrancier, Gif sur Yvette; Michel Level, and Jean Choay, both of Paris, all of France, assignors to Agence National de Valorisation de la Recherche, Paris, France

Filed Mar. 11, 1983, Ser. No. 474,361
Claims priority, application France, Mar. 15, 1982, 82 04353
Int. Cl.[4] A61K 39/00, 37/00
U.S. Cl. 530—313 25 Claims

1. An immunogenic and apyrogenic conjugate consisting essentially of a hapten covalently linked to a muramyl peptide, which conjugate comprises a molecular weight which does not exceed 5000,

wherein the hapten is selected from the group consisting of peptides, glycopeptides, oligosaccharides, lipopeptides, glycolipids, lipids and steroids which are incapable of inducing an immunological response in vivo except when bound to an immunological carrier;

and wherein the muramyl peptide part conjugated to the hapten is derived from the muramyl peptide which has the general formula (I):



(I)

in which the following groups, when not covalently linked to the hapten, have the following meaning:

R_5 is a free carboxyl group or amido group, or a carboxyl group esterified by an aliphatic alcohol possessing from 1 to 10 carbon atoms, or a carboxyl

group substituted by an amino acid possessing itself a free carboxyl group or an amidated group or a carboxyl group esterified by an aliphatic alcohol possessing from 1 to 10 carbon atoms,

R is a hydrogen or a methyl group,

R_2 is an acetamido or a glycoyl-amido group,

R_1 is either $—NH_2$, or OH, or a radical comprising at the most 10 carbon atoms, corresponding to an alkyl, aryl, arylalkyl or alkylaryl group, optionally bearing hydroxyl-, amido, carboxamido-, sulfonamido-, ether, thioether, ester- or thioester substituents

R_4 is a hydroxyl or an oxyacyl group comprising from 1 to 4 carbon atoms,

X is an aminoacyl residue of the group comprising: alanyl, arginyl, asparagyl, aspartyl, cysteinyl, glutaminyl, glutamyl, glycyl, histidyl, hydroxy-prolyl isoleucyl, leucyl, lysyl, methionyl, phenylalanyl, prolyl, seryl, threonyl, tryptophanyl, tyrosyl, valyl and aminobutyryl,

Z is a group substituting the position at C-6 of muramic acid, and which has the following general formula (II):

$$—R_6—(R_7)_x$$

in which x=0 or 1 and in which,

if x=0,

R_6 is hydroxyl or amino and,

if x=1,

R_6 is hydroxyl group or amino, carboxamido, sulfonamide ether or thioether, ester or thioester,

R_7 then being a chain of $—CH_2$, —CH=CH—, —S—, —CO— or NH groups, $—CH_2—$; —CH=CH—, or NH-groups, said groups being optionally replaced or substituted by aryl groups or by carboxlyic, amino, sulfhydryl or hydroxyl groups, or by alkyl groups including up to 5 carbon atoms or by alkylaryl groups, arylalkyl including in all up to 8 carbon atoms or by heterocyclic groups including up to six carbon atoms and one or two oxygen, nitrogen or sulfur atoms, said alkylaryl or arylalkyl groups optionally containing carbonyl groups or being optionally substituted by carboxyl, amino, sulfhydryl or hydroxyl groups, said heterocyclic groups being themselves optionally substituted by alkyl groups which can contain up to 5 carbon atoms, carboxyl, amino, sulfhydryl or hydroxyl, the above said R_7 group having none the less a length not exceeding that of an n-decyl hydrocarbon chain,

Y is a free or amidated carboxyl group, or an ester group comprising up to 10 carbon atoms, or substituted by an amino acid or is a group of formula (III):

$$—R_8—(R_9)_x \qquad \text{(III)}$$

in which x equals 0 or 1 and

in which R_8 is an amide or ester linkage when x is equal to zero, or when x is different from zero, R_8 is a carboxamido-, ester- or thioester-group, R_9 then having the same meaning as R_7;

and which conjugate when administered in vivo elicits only antibodies or a cell mediated immunological response involving the hapten.

4,639,513

INTRAVENOUSLY INJECTABLE IMMUNOGLOBULIN G (IGG) AND METHOD FOR PRODUCING SAME

Kenneth C. Hou, Glastonbury, and Garrett Cogswell, Vernon, both of Conn., assignors to Cuno Inc., Meriden, Conn.

Continuation-in-part of Ser. No. 576,448, Feb. 2, 1984, which is a continuation-in-part of Ser. No. 466,114, Feb. 14, 1983, abandoned, and a continuation-in-part of Ser. No. 643,212, Aug. 22, 1984, abandoned, and a continuation-in-part of Ser. No. 643,613, Aug. 22, 1984. This application Oct. 2, 1984, Ser. No. 656,922

Int. Cl.[4] A61K *37/04;* C07K *3/20*

U.S. Cl. 530—387 **35 Claims**

1. A method for production of high purity IgG from animal plasma, or a fraction thereof, comprising:

(1) separating IgG from said animal plasma or fraction thereof to produce partially purified IgG by ion exchange chromatography using a chromatographic media comprising a matrix material comprising a first surface reactive group—containing substrate selected from the group consisting of silica, polysaccharide, or polypeptide, said surface reactive group being selected from the group consisting of the hydroxy group of silica, the hydroxy group of polysaccharide, or the amino group of polypeptide, said first substrate covalently bonded to a first synthetic polymer, said first synthetic polymer comprising:

(a) a polymerizable compound containing an epoxy group capable of direct covalent coupling to said reactive group of said substrate; and

(b) one or more polymerizable compounds containing:

(i) an ionizable chemical group;

(ii) a chemical group capable of transformation to an ionizable group;

(2) separating high purity IgG from said partially purified IgG by affinity chromatography using a chromatographic media comprising a second matrix material comprising a second surface reactive group-containing substrate selected from the group consisting of silica, polysaccharide or polypeptide, said surface reactive group being selected from the group consisting of the hydroxy group of silica, the hydroxy group of polysaccharide, or the amino group of polypeptide, said second substrate covalently bonded to a second synthetic polymer, said second synthetic polymer comprising:

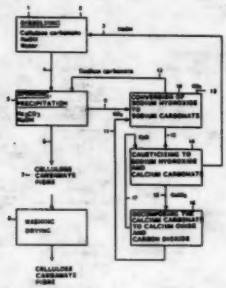
(a) a polymerizable compound containing an epoxy group capable of direct covalent coupling to said reactive group of said second substrate; and

(b) one or more polymerizable compounds containing a chemical group capable of causing the covalent coupling of said second synthetic polymer to an affinity ligand or a biologically active molecule.

4,639,514
CYCLIC PROCESS FOR PRODUCING AN ALKALI SOLUTION OF CELLULOSE CARBAMATE AND PRECIPITATING THE CARBAMATE

Olli T. Turunen; Jouko Huttunen, both of Porvoo; Johan-Fredrik Selin, Helsinki; Jan Fors, and Vidar Eklund, both of Porvoo, all of Finland, assignors to Neste Oy, Finland

Filed Sep. 24, 1985, Ser. No. 779,702
Claims priority, application Finland, Sep. 27, 1984, 843813
Int. Cl.[4] C08B 3/00; D01F 2/00
U.S. Cl. 536—30 13 Claims



1. A cyclic method of producing an alkali solution of cellulose carbamate, precipitating the cellulose carbamate in the form of fiber or film from the alkali solution, and recovering and converting the chemicals remaining after precipitation of the cellulose carbonate for reuse in the method comprising the steps of:

(a) dissolving cellulose carbamate in an aqueous solution of sodium hydroxide, thereby producing an alkali solution of cellulose carbamate;

(b) extruding said alkali solution into contact with an aqueous precipitating solution containing sodium carbonate, whereby the cellulose carbamate precipitates and can be separated from the resultant solution;

(c) conducting carbon dioxide into the solution obtained in step (b), thereby converting the sodium hydroxide into sodium carbonate and regenerating the precipitating solution;

(d) treating the solution obtained in step (c) with calcium oxide, thereby converting the sodium carbonate into sodium hydroxide and causing calcium carbonate to precipitate from the solution;

(e) recycling the solution containing sodium hydroxide obtained in step (d) to dissolve cellulose carbamate according to step (a);

(f) decomposing the calcium carbonate obtained in step (d) into carbon dioxide and calcium oxide;

(g) recycling the carbon dioxide obtained in step (f) to convert sodium hydroxide according to step (c); and

(h) recycling the calcium oxide obtained in step (f) to convert sodium carbonate according to step (d).

4,639,515
CYCLIC PROCESS FOR PRODUCING AN ALKALI SOLUTION OF CELLULOSE CARBAMATE AND PRECIPITATING THE CARBAMATE

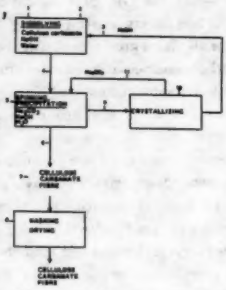
Olli T. Turunen; Jouko Huttunen, both of Porvoo; Johan-Fredrik Selin, Helsinki; Jan Fors, and Vidar Eklund, both of Porvoo, all of Finland, assignors to Neste Oy, Finland

Filed Sep. 24, 1985, Ser. No. 779,798
Claims priority, application Finland, Sep. 27, 1984, 843814
Int. Cl.[4] C08B 3/00; D01F 2/00
U.S. Cl. 536—30 16 Claims

1. A cyclic method of producing an alkali solution of cellulose carbamate, precipitating the cellulose carbamate in the form of fiber or film from the alkali solution, and recovering and converting the chemicals remaining after precipitation of the cellulose carbonate for re-use in the method, comprising the steps of:

(a) dissolving cellulose carbamate in an aqueous solution of sodium hydroxide, thereby producing an alkali solution of cellulose carbamate;

(b) extruding said alkali solution into contact with an aqueous precipitating solution containing sodium carbonate,



whereby the cellulose carbamate precipitates and can be separated from the resultant solution;

(c) withdrawing the resultant solution of step (b) and separating said solution into aqueous sodium hydroxide and sodium carbonate components;

(d) recycling the aqueous sodium hydroxide obtained in step (c) to dissolve cellulose carbamate according to step (a);

(e) recycling the sodium carbonate obtained in step (c) to regenerate the precipitating solution utilized in step (b).

4,639,516
POLYSACCHARIDE POLYOL

Akira Misaki, Osaka; Yoshiaki Sone, Sennan, and Takao Kato, Shinnanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

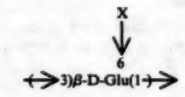
Filed Mar. 8, 1984, Ser. No. 587,475
Claims priority, application Japan, Mar. 9, 1983, 58-37486
Int. Cl.[4] C08B 37/00
U.S. Cl. 536—123 1 Claim

1. A polysaccharide polyol derived from *Volvariella volvacea*, which consists essentially of first recurring units represented by the following formula:

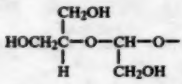
$$\rightarrow 3)\beta\text{D-Glu}(1\rightarrow$$

wherein D-Glu represents a D-glucopyranosyl group, β represents the linkage mode and each number represents the linkage position,

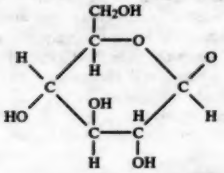
second recurring units represented by the following formula:



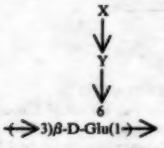
wherein D-Glu, β and each number are defined above, and X represents a group represented by the following formula:



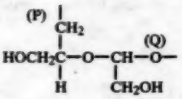
or a D-glucopyranosyl group represented by the following formula:



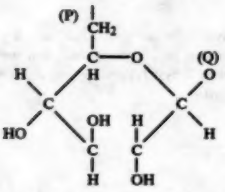
and third recurring units represented by the following formula:



wherein D-Glu, β and each number are defined above, and Y represents a group represented by the following formula:

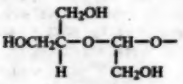


or a D-glucopyranosyl residue represented by the following formula:



in each formula, X being linked to the carbon atom to which (P) is attached and the group being linked to the glucopyranosyl residue through the oxygen atom to which (Q) is attached,

wherein a part of X, in at least one of the second recurring units and the third recurring units is a group represented by the following formula:



the average number of the third recurring units is about 4 to about 12 per 100 of the sum of the first, second and third recurring units, and the average number of the sum of the second and third recurring units is about 16 and about 33 per 100 of the sum of the first, second and third recurring units, said polysaccharide polyol having a molecular weight of about 70,000 to about 2,800,000 in gel permeation high speed liquid chromatography using as the mobile phase a tris-hydrochloride buffer solution having a concentration of 0.1 mole/l and a pH value of 8.6.

4,639,517

PROCESS FOR STABILIZING THIOCARBAMYLSULFENAMIDES

Enrique G. Reynes, Middleburg Heights, and John O. Leising, Avon Lake, both of Ohio, assignors to The B F Goodrich Company, Akron, Ohio

Filed Jul. 29, 1985, Ser. No. 760,183
Int. Cl.[4] C07C *155/04*
U.S. Cl. 544—85 **6 Claims**

1. A method for improving the heat stability of thiocarbamylsulfenamides comprising treating a thiocarbamylsulfenamide dissolved in an organic solvent with a dilute aqueous acid solution, to a pH of about 1 to less than about 5, separating the organic solution from the aqueous phase, removing the solvent from the thiocarbamylsulfenamide and drying.

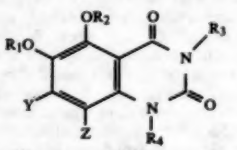
4,639,518

SUBSTITUTED QUINAZOLINEDIONES

Victor T. Bandurco, Bridgewater, N.J.; Stanley C. Bell, Narberth, Pa.; Donald W. Combs, Piscataway; Robert Falotico, Belle Mead, both of N.J., and Alfonso J. Tobia, Doylestown, Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 24, 1984, Ser. No. 653,620
Int. Cl.[4] C07D *239/96*
U.S. Cl. 544—285 **8 Claims**

1. A compound of the formula



wherein R_1 and R_2 are the same or different substituents and are hydrogen, lower alkyl having 1–5 carbon atoms or —CH_2— when taken together; Y and Z are the same or different and are hydrogen, nitro, amino, acetamido, alkylamino wherein the alkyl group 1–5 carbon atoms, alkyl wherein the alkyl group has 1–5 carbon atoms, cycloalkylamino wherein the cycloalkyl group has 4–8 carbon atoms, and cycloalkyldiamino wherein the cycloalkyl group has 4–8 carbon atoms, carboxy, carboalkoxy wherein the alkoxy group has 1–5 carbon atoms, cyano, methanesulfonyl, carboxamide, and halo; R_3 is hydrogen, alkyl wherein the alkyl group has 1–5 carbon atoms, hydroxyalkyl wherein the alkyl group has 1–5 carbon atoms, haloalkyl wherein he alkyl group has 1–5 carbon atoms, amino, dialkylamino wherein the alkyl group has 1–5 carbon atoms, dialkylamino alkyl wherein the alkyl group has 1–5 carbon atoms, cycloalkylamino and cycloalkylaminoalkyl wherein the alkyl group has 1–5 carbon atoms and the cycloalkyl group has 5–6 carbon atoms, phenyl, substituted phenyl wherein the substituent is halo, lower alkoxy, alkyl having 1–5 carbon atoms; alkylphenyl wherein the alkyl group has 1–5 carbon atoms; substituted alkylphenyl wherein the substituent is nitro, amino, alkylamino having 1–5 carbon atoms, cycloalkylamino and cyclodialkylamino wherein the cycloalkyl group has 4–8 carbon atoms, carboxy, carboalkoxy wherein the alkoxy group has 1–5 carbon atoms, mono-and dihydroxy, cyano, methanesulfonyl, carboxamide or halo; R_4 is hydrogen, lower

alkyl wherein the alkyl group has 1–5 carbon atoms, carboalkoxy and $R_5CH_2CH_2X$ wherein R_5 is hydrogen or lower alkyl; X is carboxy, carboalkoxy wherein the alkoxy group has 1–3 carbon atoms, cyano, carboxamido, methanesulfonyl, formyl, benzoyl and substituted benzoyl and the pharmaceutically acceptable salts thereof; provided that when R_3 is amino or alkylamino wherein the alkyl group has 1–5 carbon atoms, Y and Z are not simultaneously hydrogen.

4,639,519
2-SUBSTITUTED ALKYLAMINOPYRIMIDONES USEFUL AS H_2-ANTAGONISTS AND ANTIINFLAMATORY AGENTS

Charon R. Ganellin, Welwyn; Robert J. Ife, Stevenage, and David A. A. Owen, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden, England

Division of Ser. No. 549,953, Nov. 9, 1983, Pat. No. 4,558,128, which is a division of Ser. No. 290,628, Aug. 6, 1981, Pat. No. 4,439,435, which is a division of Ser. No. 56,171, Jul. 10, 1979, Pat. No. 4,305,945. This application May 1, 1985, Ser. No. 729,448

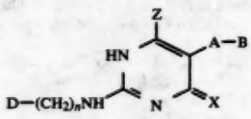
Claims priority, application United Kingdom, Jul. 15, 1978, 29999/78

The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.[4] C07D *239/02;* A61K *31/505*

U.S. Cl. 544—320 **1 Claim**

1. A compound of the formula



where D is HO—; n is from 3 to 8; X is oxygen or sulphur; Z is hydrogen or lower alkyl; A is straight or branched C_1–C_5 alkylene or $—(CH_2)_pW(CH_2)_q—$ where W is oxygen or sulphur and the sum of p and q is 1 to 4; and B is methyl, C_3–C_6 cycloalkyl, a heteroaryl group selected from pyridyl, N-oxopyridyl, furyl, thienyl, thiazolyl, oxazolyl, isothiazolyl, imidazolyl, pyrimidyl, pyrazyl, pyridazyl, thiadiazolyl, quinolyl, isoquinolyl, 5,6,7,8-tetrahydroquinolyl, 1,3-dioxolopyridyl, benzimidazolyl and benzthiazolyl, said heteroaryl group being optionally substituted by one or more lower alkyl, lower alkoxy, halo, hydroxy or amino groups or B is a naphthyl, 5- or 6-(2,3-dihydro-1,4-benzodioxinyl) or 4- or 5-(1,3-benzodioxolyl) group, or a phenyl group optionally substituted with one or more lower alkyl, lower alkoxy, halogen, phenyl(lower alkoxy), hydroxy, lower alkoxy-lower alkoxy, trifluoromethyl, di(lower alkyl)amino, phenoxy, halophenoxy, lower alkoxyphenoxy, phenyl, halophenyl or lower alkoxyphenyl group, provided that —A—B is not alkyl, in the form of the free base or a pharmaceutically acceptable acid addition salt thereof.

4,639,520
PREPARATION OF 14-HYDROXY-N-ETHOXY-CARBONYL-NORCODEINONE

Frank Kavka, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Mar. 27, 1984, Ser. No. 593,752

Int. Cl.[4] C07D *489/08*

U.S. Cl. 546—45 **21 Claims**

1. A method for preparing N-ethoxycarbonyl-14-β-hydroxynorcodeinone, which comprises contacting N-ethoxycarbonyl-norcodeinone enol acetate

(i) with an aromatic or aliphatic non-basic or poly-basic peroxy-acid

(ii) under reaction conditions effective for substituting an —OH group in the 14-position of the norcodeinone enol acetate,

said reaction conditions including:

(I) substantial absence of systems for chemical generation of singlet oxygen;

(II) the presence of

(A) a moderately strong acid having a pk_a of from about 0.3 to about 3.5 and

(B) an inert organic solvent which is a solvent for and substantially non-reactive with the N-ethoxycarbonyl-norcodeinone enol acetate, said peroxy-acid and said moderately strong acid; said solvent being present in a solubilizing amount for each of the N-ethoxycarbonyl-norcodeinone enol acetate, said peroxy-acid and said moderately strong acid;

(III) the substantial absence of water;

(IV) at least about 1 gram-equivalent of said peroxy-acid being present per gram-mole of the N-ethoxycarbonyl-norcodeinone enol acetate; and

(V) the substantial absence of an acid having a pK_a of less than 0.3.

4,639,521
ISOQUINOLINE DERIVATIVES

Kunio Sannohe; Kengo Otsuka; Toshohiko Ito, all of Kanagawa; Masahiko Maruyama, Chiba; Takafumi Kitano, Chiba, and Makoto Hirayama, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

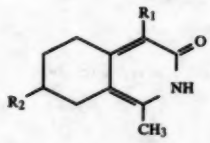
Filed Jun. 20, 1986, Ser. No. 878,527

Claims priority, application Japan, Jul. 2, 1985, 60-144008

Int. Cl.[4] C07D *401/04, 217/24*

U.S. Cl. 546—141 **5 Claims**

1. Isoquinoline derivatives represented by the general formula:



(I)

wherein R_1 denotes a hydrogen or halogen atom, or a nitro or acetyl group, and R_2 denotes a hydrogen atom, or a methyl, methoxy, phenyl, 4-pyridyl or 2-pyridyl group, and therapeutically acceptable salts thereof.

4,639,522
1-BENZYL-3,5-DIMETHYL-4-PIPERDYL ESTER OF A HANTZSCH DIHYDROPYRIDINE

Kenji Muto; Toru Sugaya, both of Shizuoka; Tokuyuki Kuroda, Susono; Tamotsu Hashimoto, Numazu; Koji Yamada; Nobuhiro Nakamizo, both of Machida, and Minoru Watanabe, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 542,185, Oct. 14, 1983, abandoned. This application Feb. 14, 1986, Ser. No. 829,179

Claims priority, application Japan, Oct. 15, 1982, 57-180615

Int. Cl.[4] C07D *401/12;* A61K *31/455*

U.S. Cl. 546—194 **1 Claim**

1. A compound; namely, 2,6-dimethyl-4-(3-nitrophenyl)-1,4-dihydropyridine-3,5-dicarboxylic acid 3-(1-benzyl-3,5-dimethyl-4-piperidyl)-5-methyl ester hydrochloride.

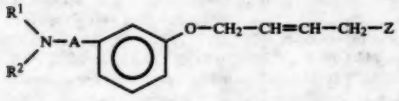
4,639,523

AMINOALKYLPHENOXY DERIVATIVES

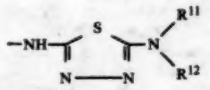
Fujio Nohara, Takaoka, and Tomoaki Fujinawa, Toyama, both of Japan, assignors to Ikeda Mohando Co., Ltd., Toyama, Japan

Filed May 24, 1985, Ser. No. 737,489
Claims priority, application Japan, Jun. 1, 1984, 59-112746
Int. Cl.[4] C07D *401/12, 417/12, 285/12*
U.S. Cl. 546—209 3 Claims

1. An amino alkyl phenoxy derivative having the formula:



wherein R^1 and R^2 are individually hydrogen atoms or lower alkyl groups having 1 to 4 carbon atoms, or R^1 and R^2 form, together with a bonded nitrogen atom, a 4 to 8 member heterocyclic ring selected from the group consisting of azetidino-, pyrrolidino-, piperidino- and perhydroazepino- groups, which is unsubstituted or substituted by one or more hydroxyl, methoxy, ethoxy, or lower alkyl groups of 1 to 6 carbon atoms; A is a straight-chain or a branched-chain alkylene group having 1 to 4 carbon atoms; and Z is a moiety of the formula:



wherein R^{11} and R^{12} are each hydrogen, or lower alkyl, lower alkenyl, lower alkynyl or lower alkyl groups or a heterocyclic aryl alkyl group selected from the group consisting of 2-pyridinomethyl, 3-pyridinomethyl, 2-thiophenomethyl, 3-thiophenomethyl, 2-furanomethyl and 3-furanomethyl; or a heterocyclic group formed respectively by R^{11} and R^{12} together with the nitrogen atom bonded therewith selected from the group consisting of azetidino-, pyrrolidino- and piperidino- rings; or a hydrate, salt or solvate thereof.

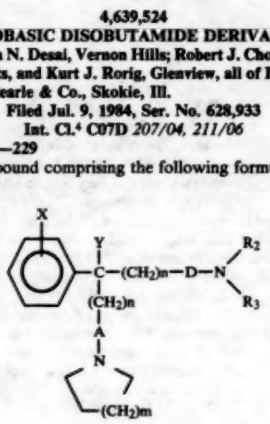
4,639,524

MONOBASIC DISOBUTAMIDE DERIVATIVES

Bipinchandra N. Desai, Vernon Hills; Robert J. Chorvat, Arlington Heights, and Kurt J. Rorig, Glenview, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Jul. 9, 1984, Ser. No. 628,933
Int. Cl.[4] C07D *207/04, 211/06*
U.S. Cl. 546—229 3 Claims

1. A compound comprising the following formula:



and the pharmaceutically acceptable acid addition salts thereof wherein X represents a halo, lower alkyl, hydrogen, trifluormethyl, phenyl, or lower alkoxy substituent; Y represents —CN, —$CONH_2$, $CON(R_1)_2$ or CO_2R_1 where R_1 is a lower alkyl; m is an integer 1 or 2 and n is an integer from 1 to 3 inclusive; R_2 represents lower alkyl; R_3 represents acetyl, benzoyl, phenacetyl or trifluoroacetyl; and A and D are methylene.

4,639,525

PROCESS FOR THE PREPARATION OF PYRIDONE-2 BY DEMETHYLATION

Roland E. van der Stoel, Born, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 14, 1984, Ser. No. 671,308
Claims priority, application Netherlands, Nov. 28, 1983, 8304065
Int. Cl.[4] C07D *213/64*
U.S. Cl. 546—290 5 Claims

1. A gas phase process for preparing 2-pyridone, that 6-methyl-2-pyridone is contacted with a metal catalyst selected from the group consisting of nickel, cobalt, platinum, palladium and ruthenium, in the presence of water at a temperature of 200° C. to 500° C. to obtain a reaction mixture containing 2-pyridone; and

subsequently recovering 2-pyridone from the reaction mixture so produced.

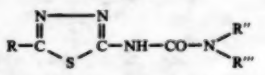
4,639,526

N-SUBSTITUTED 5-AMINO-1,3,4-THIADIAZOLES

Carl Metzger; Ludwig Eue, and Helmuth Hack, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1968, Ser. No. 756,284
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1967, F53531
Int. Cl.[4] A01N *47/36;* C07D *285/12*
U.S. Cl. 548—140 5 Claims

1. N-substituted 5-amino-1,3,4-thiadiazole having the formula



in which R is alkyl-mercapto having 1–4 carbon atoms, R″ is selected from the group consisting of hydrogen and alkyl having 1–4 carbon atoms, and R‴ is selected from the group consisting of alkyl having 1–4 carbon atoms and alkenyl having 2–4 carbon atoms.

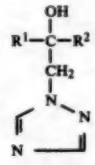
4,639,527

PROCESS FOR THE PREPARATION OF β-HYDROXYETHYL-(1,2,4-TRIAZOLE) DERIVATIVES

Reinhard Lantzsch, Leverkusen, and Karl-Julius Reubke, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,553
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342693
Int. Cl.[4] C07D *249/08*
U.S. Cl. 548—262 9 Claims

1. A process for the preparation of a β-hydroxyethyl-(1,2,4-triazole) derivative of the formula

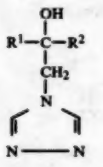


(I)

in which

R^1 is methyl, ethyl, propyl, isopropyl, n-butyl, iso-butyl, sec.-butyl or tert.-butyl, or methyl, ethyl, propyl, isopropyl, n-butyl, iso butyl, s.c.-butyl or tert.-butyl which is substituted by 1 to 3 fluorine and/or chlorine atoms, or represents cyclopropyl, cyclopentyl or cyclohexyl which is optionally substituted by methyl, or represents phenyl, which can be mono-, di- or tri-substituted by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl, or represents phenethyl, which can be 1-, 2- or 3-substituted in the phenyl part by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl, and

R^2 is hydrogen, methyl, ethyl, propyl isopropyl, n-butyl, isobutyl, sec.-butyl or tert.-butyl, or methyl, ethyl, propyl, isopropyl, n-butyl, iso-butyl, sec.-butyl or tert.-butyl which is substituted by 1 to 3 fluorine and/or chlorine atoms, or represents alkenyl with 2 to 6 carbon atoms, alkinyl with 2 to 6 carbon atoms, or cyclopropyl, cyclopentyl or cyclohexyl which is optionally substituted by methyl, or cyclopentenyl, cyclohexenyl, cycloheptenyl or cyclooctenyl which is optionally substituted by methyl, or represents phenyl, which can be mono-, di- or tri-substituted by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl, or represents phenethyl, which can be 1-, 2- or 3-substituted in the phenyl part by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl which process comprises stirring a β-hydroxyethyl-(1,3,4-triazole) derivative of the formula



(II)

in which

R^1 and R^2 have the abovementioned meanings, in the presence of a base and in the presence of N-methylpyrrolidone.

4,639,528

CRYSTALLINE FORM OF 7-(DIMETHYLAMINOMETHYLENE-AMINO-9A-METHOXYMITOSANE

Murray A. Kaplan, Syracuse, and Dolatrai M. Vyas, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 21, 1985, Ser. No. 703,778
Int. Cl.[4] C07D *487/14*
U.S. Cl. 548—422 3 Claims

1. A new crystalline form of 7-(dimethylaminomethylene)amino-9a-methoxymitosane having an infrared absorption spectrum (potassium bromide disc) exhibiting principal absorption peaks at 3430, 3310, 2920, 1720, 1620, 1540, 1455, 1440, 1420, 1400, 1375, 1310, 1270, 1230, 1205, 1100, 1065, 950, 850, 780, 700, 625, 575, and 525 reciprocal centimeters.

3. A process for preparing crystalline 7-(dimethylaminomethylene)amino-9a-methoxymitosane which comprises slurrying amorphous 7-(dimethylaminomethylene)amino-9a-methoxymitosane in ethyl ether and thereafter adding a small amount of crystalline 7-(dimethylaminomethylene)amino-9a-methoxymitosane to cause crystallization of the amorphous 7-(dimethylaminomethylene)amino-9a-methoxymitosane.

4,639,529

ANALGESIC AND ANTI-INFLAMMATORY COMPOUNDS

Bola V. Shetty, Stamford, Conn.; Arthur McFadden, East Brunswick, N.J., and Peter Hofer, Liestel, Switzerland, assignors to The Purdue Frederick Company, Norwalk, Conn.

Division of Ser. No. 349,992, Feb. 19, 1982, Pat. No. 4,476,311, which is a continuation of Ser. No. 129,578, Dec. 3, 1980, abandoned. This application Jun. 18, 1984, Ser. No. 621,680
Int. Cl.[4] C07D *207/12*
U.S. Cl. 548—550 3 Claims

1. The compound 1-benzyl-4-N,N-dimethylaminomethyl-5-(3-methoxyphenyl)-pyrrolidin-2-one.

2. The compound 4-dimethylaminomethyl-5-(3-methoxyphenyl)-1-phenyl pyrrolidin-2-one.

3. The compound 1-benzyl-4-N,N-dimethylaminomethyl-5-(3-hydroxyphenyl)-pyrrolidin-2-one.

4,639,530

PROCESS FOR MAKING MALEIC ANHYDRIDE

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 666,997, Oct. 31, 1984, Pat. No. 4,604,371, which is a continuation-in-part of Ser. No. 461,942, Jan. 28, 1983, Pat. No. 4,481,363, Ser. No. 646,291, Aug. 29, 1984, abandoned, Ser. No. 492,163, May 6, 1983, Pat. No. 4,562,291, and Ser. No. 492,226, May 6, 1983, said Ser. No. 461,942, is a division of Ser. No. 289,806, Aug. 3, 1981, Pat. No. 4,388,221, said Ser. No. 646,291, is a continuation-in-part of Ser. No. 461,942, , which is a division of Ser. No. 289,806, , said Ser. No. 492,163, and Ser. No. 492,226, each is a continuation-in-part of Ser. No. 275,370, Jun. 19, 1981, abandoned. This application Jun. 27, 1985, Ser. No. 749,556
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.[4] C07D *307/60*
U.S. Cl. 549—260 34 Claims

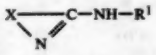
1. A method for producing maleic anhydride which comprises contacting molecular oxygen and a C_4 to C_{10} hydrocarbon under reaction conditions with an oxidation catalyst comprising vanadium and phosphorus components in combination with a microporous crystalline silica or a crystalline zeolite having a silica-to-alumina ratio of at least 6.0.

4,639,531
PROCESS FOR THE PREPARATION OF DIMETHYLMALEIC ANHYDRIDE

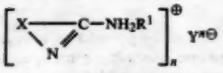
Marcus Baumann, and Werner Breitenstein, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 6, 1985, Ser. No. 762,752
Claims priority, application Switzerland, Aug. 15, 1984, 3910/84
Int. Cl.[4] C07D *307/60*
U.S. Cl. 549—261 **11 Claims**

1. A process for the preparation of dimethylmaleic anhydride by reacting 2 equivalents of maleic acid, fumaric acid and/or maleic anhydride at a temperature of at least 90° C. and in the presence of an amidine of formula I and/or an amidine salt of formula II



(I)



(II)

in which formulae R^1 is a hydrogen atom, alkyl, cycloalkyl, carboxyalkyl, aryl, aralkyl, alkaryl, or alkaralkyl, Y is an anion of an inorganic or organic protonic acid, n is an integer from 1 to 3, and X, together with the group

forms the radical of a substituted or unsubstituted 5- or 6-membered heterocyclic ring which may contain further hetero atoms, which process comprises employing the compounds of formulae I and II in catalytic amounts of 0.1 to 15 mol%, based on maleic acid, fumaric acid and/or maleic anhydride.

4,639,532
PROCESS FOR PREPARING SYNTHETIC PERIPLANONE-B

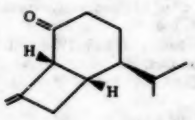
Stuart L. Schreiber, Bethany, Conn., assignor to Yale University, New Haven, Conn.

Filed Jun. 18, 1984, Ser. No. 621,574
Int. Cl.[4] C07D *493/10*
U.S. Cl. 549—332 **8 Claims**

1. A process for synthesizing periplanone-B comprising:

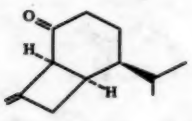
a. reacting allene and 4-isopropyl-2-cyclohexen-1-one by photocycloaddition to form a mixture of:

IIIa



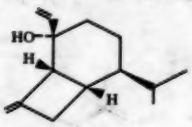
and

IIIb



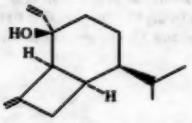
b. reacting the mixture of IIIa and IIIb with a vinyl metallic halide to form the corresponding allylic carbinols having the structure:

IVa



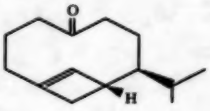
and

IVb



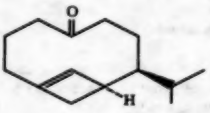
c. reacting the product of step b with strong base which will deprotonate an alcohol to form compounds having the structure:

Va



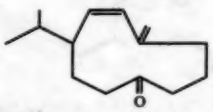
and

Vb

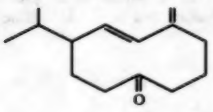


d. heating the product of step c to thereby obtain electrocyclic ring opening to form a mixture of:

VI



VII

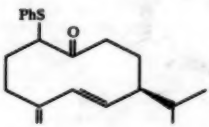


in a molar ratio of cis-diene (VI) to trans-diene (VII) of about 2/1;

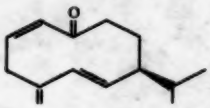
e. irradiating with light the mixture produced in step d to form a mixture of VI and VII in a molar ratio of 1/15, respectively and isolating VII from such mixture;

f. reacting VII with a base strong enough to deproponate a ketone followed by reaction with a sulfenylating agent to form a 16/1 regioisomeric mixture of monosulfenylated ketones having the general formula:

VIII



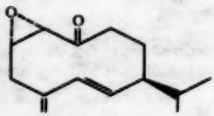
g. reacting the product of step f with $NaIO_4$ to form the corresponding sulfoxides followed by pyrolysis to form:



IX

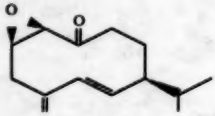
and isolating IX from the reaction mixture;

h. reacting IX with t-butyl hydroperoxide to form a mixture of cis epoxides Xa and Xb in a molar ratio of beta/alpha of about 4/1



Xa

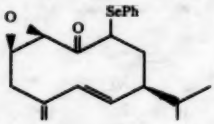
alpha-epoxide



Xb

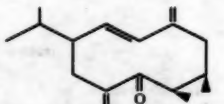
beta-epoxide

i. reacting Xa and Xb with a base strong enough to deprotonate a ketone followed by reaction with a selenylizing agent to form the selenide:



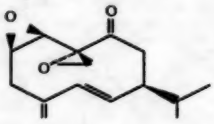
XI

reacting XI with H_2O_2 to the corresponding selenoxide and rearranging the selenoxide in the presence of anhydrous sodium acetate and acetic anhydride to form the alpha-diketone:



XII

j. reacting XII with the ylide formed from trimethylsulfonium iodide and dimsyl sodium to form periplanone-B having the structure



I

4,639,533

ALPHA TOCOPHEROL PROCESS

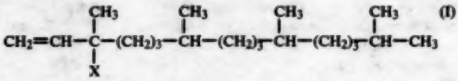
Jeffrey L. Finnan, Southgate, Mich., assignor to BASF Corporation, Wyandotte, Mich.

Filed Jul. 29, 1982, Ser. No. 403,085

Int. Cl.[4] C07D *311/72*

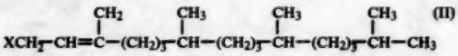
U.S. Cl. 549—411 19 Claims

1. A process for producing alpha tocopherol comprising reacting, in the presence of an inert organic solvent, trimethylhydroquinone with a phytyl derivative selected from the group consisting of at least one of



(I)

and



(II)

wherein X is a leaving group, in the presence of at least one aprotic Lewis acid, at least one protonic strong acid, and at least one amine having about 7 to about 24 carbon atoms.

4,639,534

ISOLATION OF PSEUDOMONIC ACID

Alan D. Curzons, Brighton, England, assignor to Beecham Group p.Lc., England

Continuation of Ser. No. 332,669, Dec. 21, 1981, abandoned, which is a continuation of Ser. No. 207,773, Nov. 17, 1980, abandoned, which is a division of Ser. No. 36,061, May 4, 1979, abandoned. This application Dec. 21, 1984, Ser. No. 684,479

Claims priority, application United Kingdom, May 20, 1978, 20958/78

Int. Cl.[4] C07D *309/10*

U.S. Cl. 549—414 4 Claims

1. A process for the isolation of pseudomonic acid from a crude preparation thereof which process comprises extracting the crude preparation into a polar, organic, water-immiscible solvent in which the pseudomonic acid is soluble, treating the extract with a lithium salt of an alkanoic acid of formula $R—CO_2^-Li^+$, wherein R is an alkyl group containing from 1 to 20 carbon atoms, separating the resulting lithium pseudomonate and thereafter hydrolysing the lithium pseudomonate to produce pseudomonic acid.

4,639,535

TRISUBSTITUTED BENZENE DERIVATIVES AND A METHOD FOR THE PREPARATION THEREOF

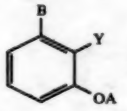
Trevor S. Abram, Marlow; Peter Norman, Slough, and Brian T. Warren, Ickenham, all of England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 615,042, May 29, 1984, Pat. No. 4,571,405. This application Oct. 30, 1985, Ser. No. 792,851

Int. Cl.[4] C07D *263/04, 309/10*

U.S. Cl. 549—419 4 Claims

1. A compound of the formula:

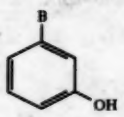


wherein B is selected from the group consisting of —NHCOC$(CH_3)_3$, 1,3-oxazolinyl and —CONHR, wherein R is methyl, phenyl, or t-butyl; Y is selected from the group consisting of CO_2H, CHO, CO_2R' and COR', wherein R' is a

lower alkyl having from 1 to 4 carbon atoms; and A is H or tetrahydropyran.

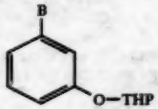
4. A method for preparing the compound of claim 1 comprising the steps of:

(a) reacting 3-aminophenol with an amino-protecting moiety to produce a compound of the formula:



wherein B has the meaning defined above;

(b) reacting the product of (a) with a hydroxy-protecting moiety to produce a compound of the formula:



wherein THP refers to tetrahydropyran; and

(c) reacting the compound of (b) with a lithiating agent and a compound containing said Y moiety.

4,639,536

INTERMEDIATE, ITS SYNTHESIS, AND ITS USE IN A PROCESS FOR THE PREPARATION OF 2,3-DIHYDRO-2,2-DIMETHYL-7-HYDROXYBENZOFURAN

Constance A. Fellows, Durham, and Wallace Y. Fu, Chapel Hill, both of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

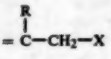
Filed Aug. 30, 1984, Ser. No. 645,714

Int. Cl.⁴ C07D *307/86*; C07C *43/23*

U.S. Cl. 549—462 **17 Claims**

1. A process for the preparation of 2-(2-hydroxy-2-methylpropoxy)phenol which comprises reacting catechol with an alkylating agent of the formula:

wherein Q is



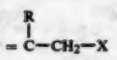
wherein R is halogen and X is halogen;

in the presence of a base and a solvent in an environment with a pH greater than about 9 to form 2-(2-hydroxy-2-methylpropoxy)phenol.

10. A process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran which comprises:

(a) reacting catechol with an alkylating agent of the formula:

wherein Q is



wherein R is halogen and X is halogen;

in the presence of a base and a solvent in an environment with a pH greater than about 9 to form 2-(2-hydroxy-2-methylpropoxy)phenol; and

(b) heating the resultant 2-(2-hydroxy-2-methylpropoxy)-phenol in the presence of an acid catalyst at a temperature greater than about 90° C. to form the 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran.

4,639,537

CERTAIN LAEVOROTATORY P-TOLYSULFONYL OR METHANESULFONYL PROPIONIC ACID ESTER INTERMEDIATES

Koichi Moriya, Hachioji, Japan; Uwe Priesnitz, Solingen, Fed. Rep. of Germany; Hans-Jochem Riebel, Wuppertal, Fed. Rep. of Germany; Ludwig Eue, Leverkusen, Fed. Rep. of Germany, and Robert R. Schmidt, Bergish-Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

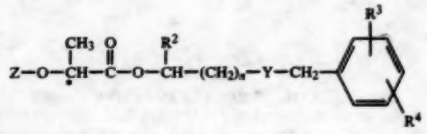
Division of Ser. No. 560,725, Dec. 12, 1983, Pat. No. 4,596,599. This application May 24, 1985, Ser. No. 738,105

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247930

Int. Cl.⁴ C07C *143/38, 149/32, 149/40*

U.S. Cl. 558—48 **3 Claims**

1. A laevorotatory enantiomer of the formula



in which

Z represents tosyl or mesyl,

Y represents oxygen or the radical SO_m,

wherein

m represents 0, 1 or 2,

R^2 represents hydrogen or methyl,

n represents 1 or 2 and

R^3 and R^4 independently of one another represent hydrogen, halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, nitro, cyano or alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy group.

4,639,538

DEODORIZED COMPOSITIONS BASED ON ORGANOTHIOPHOSPHORUS COMPOUNDS

Hubert Linares, Caluire, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France

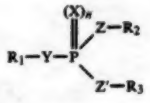
Filed May 8, 1984, Ser. No. 608,097

Claims priority, application France, May 10, 1983, 83 08020

Int. Cl.⁴ C07F *9/16*

U.S. Cl. 558—71 **9 Claims**

1. Deodorised compositions based on organothiophosphorus compounds which contain organothiophosphorus compounds of the formula:



in which:

R_1 denotes a hydrogen atom, an alkyl radical containing from 1 to 8 carbon atoms, preferably from 1 to 4 carbon atoms,

R_2 denotes an alkyl radical containing from 1 to 8 carbon atoms, preferably from 2 to 4 carbon atoms,

R_3 denotes an alkyl radical containing from 1 to 8 carbon atoms, preferably from 1 to 4 carbon atoms, optionally substituted by a halogen atom, a carbonamide group itself optionally substituted by at least one alkyl or alkylthio or alkoxycarbonyl or a phenyl radical, phenyl substituted by 1 to 3 substituents chosen from the group comprising a halogen atom, an alkyl containing from 1 to 4 carbon atoms, and the nitro and cyano group.

X, Y, Z and Z', which may be identical or different, denote an oxygen atom or a sulphur atom, with n being an integer equal to 0 or 1, Y being moreover capable of being a direct bond between R_1 and the phosphorus atom, and at least one of X, Y, Z and Z' necessarily being a sulphur atom, and an effective quantity of styrene as a deodoriser.

4,639,539

DIMERIZATION PROCESS IMPROVEMENTS

Leonard L. Hovey; Marion J. Mathews, III, and P. Robert Peoples, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 686,109, Dec. 24, 1984, abandoned, and a continuation-in-part of Ser. No. 664,625, Oct. 25, 1984, abandoned. This application Dec. 3, 1985, Ser. No. 804,013

Int. Cl.[4] C07C *121/30*

U.S. Cl. 558—363 **4 Claims**

1. In a process for the production of 1,4-dicyano-1-butene from acrylonitrile where the acrylonitrile is catalytically dimerized in the presence of an organic phosphorus (III) catalyst, selected from the group consisting of phosphinites and phosphonites, an inert hydrocarbon reaction slovent and a non-interfering proton-donating solvent; and the dimerized product is thereafter separated from the catlyst by extraction, the improvement characterized in that in the extraction the dimerized product is dissolved in an extraction solvent consisting essentially of an amide of the empirical formula

where R_1 and R_2 individually have 0-6 carbon atoms and are individually selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl, and is removed from the catalyst by phase separation.

4,639,540

DICYANOETHENYL FATTY COMPOUNDS AND DERIVATIVES THEREOF

Michael J. Virnig, Fridley, and James P. Clark, St. Anthony, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Feb. 28, 1985, Ser. No. 706,540

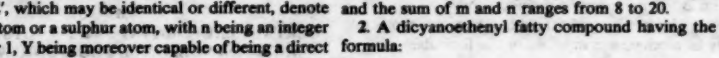
Int. Cl.[4] C07C *121/30*

U.S. Cl. 558—444 **4 Claims**

1. A dicyanoethenyl fatty compound having the structural formula:

where m and n are integers, provided that n is greater than 4 and the sum of m and n ranges from 8 to 20.

2. A dicyanoethenyl fatty compound having the structural formula:



wherein R is H or methyl, m and n are integers and provided that n is greater than 4 and the sum of m and n ranges from 8 to 20.

4,639,541

SUBSTITUTED PHENYLACETIC ACID IODOPROPARGYL ESTERS, BIOCIDAL AGENTS CONTAINING SAME AND PROCESS FOR MANUFACTURING SAME

Gerhard Staiger, Munich; Tassilo Selmayr, Freising; Peter Kinzel, Feldkirchen-Westerham, and Anneliese Reütter, Engelharting, all of Fed. Rep. of Germany, assignors to Consortium fur elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

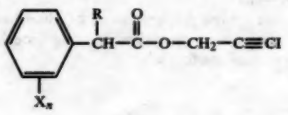
Filed Apr. 25, 1985, Ser. No. 727,027

Claims priority, application Fed. Rep. of Germany, May 7, 1984, 3416722

Int. Cl.[4] C07C *79/46, 69/76*

U.S. Cl. 560—20 **12 Claims**

1. A compound of the formula:



wherein,

R represents a member selected from the group consisting of hydrogen, fluorine, chlorine, bromine, iodine, methoxy, 1-imidazolyl and 1,2,4-triazolyl;

X represents one or more of the same or different substituents independently selected from the group consisting of fluorine, chlorine, bromine, iodine, cyano, nitro, carboxyl, an alkyl of 1 to 12 carbon atoms, an alkoxy of 1 to 12 carbon atoms, a cycloalkyl of 3 to 6 carbon atoms, formyl, acetyl, propionyl, benzoyl, phenylsulfonyl, phenyl, phenoxy, and substituted phenyl and phenoxy each having from 1 to 3 substituents selected from the group consisting of fluorine, chlorine, bromine, nitro, methyl and methoxy; and

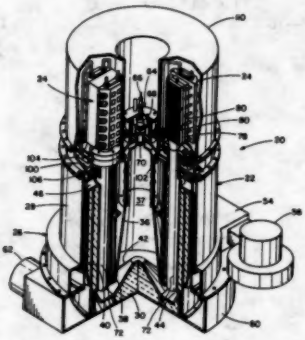
n is an integer of from 1 to 5 and, with the proviso that R does not represent hydrogen, n is 0 or an integer from 1 to 5.

4,639,542

MODULAR THERMOELECTRIC CONVERSION SYSTEM

John C. Bass, and Norbert B. Elsner, both of La Jolla, Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Jun. 11, 1984, Ser. No. 618,991
Int. Cl.[4] H01L *35/28*
U.S. Cl. 136—210 14 Claims



1. A thermoelectric conversion system including a burner assembly and a plurality of modules for converting thermal energy resulting from the operation of said burner assembly into electrical energy, said burner assembly comprising:

a central combustion chamber for providing hot gase;

a plurality of heat pipes extending vertically throughout their length with each having an evaporator section for boiling a liquid to form vapor and a condenser section for condensing said vapor to form said liquid with the evaporator sections hanging pendant and disposed at spaced locations about said combustion chamber; and

flow means for causing the hot gases provided by said combustion chamber to flow past said evaporator sections thereby heating said sections to boil said liquid,

said heat pipes and said conversion modules corresponding in number, with each of said modules connected in heat transfer relationship with a corresponding heat pipe condenser section.

4,639,543

SEMICONDUCTOR DEVICES HAVING A METALLIC GLASS SUBSTRATE

Pao-Hsien Fang, Belmont, Mass., assignor to Richard J. Birch, Wellesley, Mass., a part interest

Continuation-in-part of Ser. No. 698,073, Feb. 4, 1985, abandoned. This application Mar. 8, 1985, Ser. No. 709,572
Int. Cl.[4] H01L *31/04*
U.S. Cl. 136—256 14 Claims

13. A solar cell comprising:

an amorphous and electrically conductive substrate of metallic glass, said substrate forming one electrode of the solar cell;

at least one semiconductor layer deposited on said metallic glass substrate; and,

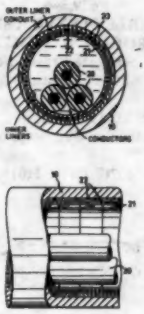
another electrode in electrically conductive contact with said at least one semiconductor layer said metallic glass substrate having one or more constituents of zinc, silicon, and copper, said one or more constituents providing an autodoping source and stabilizer for the deposited, immediately superimposed semiconductor layer.

4,639,544

PIPE-TYPE CABLE SYSTEM WITH ELECTROMAGNETIC FIELD SHAPER

Joseph H. Dablen, 806 Queensbridge Drive, Mississauga, Ontario, Canada (L5C 3K4), and Raymond D. Findlay, 574 Tuscarora Road, Ancaster, Ontario, Canada (L9G 3N3)

Filed Aug. 1, 1985, Ser. No. 761,537
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—32 19 Claims



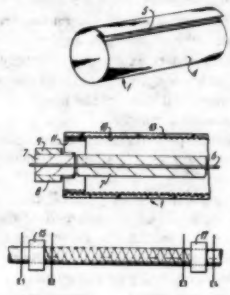
1. In an electrical cable system for transmitting alternating current at power frequency, the system comprising a group of individually insulated conductors extending side by side within a metallic conduit, the conduit having a continuous interior wall and the conductors being disposed eccentrically within the conduit adjacent a first longitudinally extending region of said inner wall, a metallic first liner interposed between the conductors and said wall, the first liner having a longitudinal slot extending throughout its length, the slot being disposed adjacent a second longitudinally extending region of said wall opposite the first region.

4,639,545

RECOVERABLE ARTICLE FOR SCREENING

Kenneth B. Pithouse, nr. Swindon Wiltshire; Thomas P. H. Jones, Cirencester; Frank J. Lowe, Freshbrook, and Richard S. Skipper, Highworth Wiltshire, all of United Kingdom, assignors to Raychem Limited, London, England

Filed Feb. 5, 1985, Ser. No. 698,303
Claims priority, application United Kingdom, Feb. 7, 1984, 8403203
Int. Cl.[4] H01B *7/34*
U.S. Cl. 174—36 14 Claims



1. An article capable of screening an electrical component, which comprises:

(a) a recoverable fabric having as a component thereof fibres comprising an electrically conductive material; and

(b) means for electrically terminating said fibres, said article after recovery having a surface transfer impedance of 5 ohm/m or less, measured over a frequency of from 1 to 50 MHz.

4,639,546

INSERT FOR A CABLE SLEEVE AND METHOD FOR THE PRODUCTION THEREOF

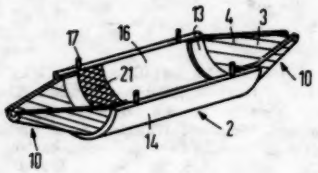
Hans-Jürgen Meltsch, Schwerte-Ergste, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 23, 1985, Ser. No. 790,559

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1984, 3439711

Int. Cl.⁴ H02G *15/08*; H01R *43/00*

U.S. Cl. 174—92 **37 Claims**



1. An insert for an electrical cable sleeve, consisting of an approximately rectangular central part and at least one contiguous lateral part which has incisions starting from the outwardly directed end, whereby strips are formed which serve to bridge the difference in diameter between the central part and an introduced cable, wherein incision angles are formed by the incisions in the lateral part extending obliquely in the same direction relative to the longitudinal axis of the insert, in such a way that in the mounted state of the insert the strips can be turned into the reduced diameter.

35. A method for the production of an electrical cable sleeve insert for mounting, over a cable splice, consisting of the steps of:

winding a rectangular central part of an insert in which lateral parts are attached to each end of the central part around cable splice material to be wrapped;

turning obliquely projecting strips of each respective lateral part of the insert inwardly or outwardly by light application of pressure and with a simultaneous rotational movement in a direction given by incision angles of incisions in the lateral part forming the strips to the longitudinal direction of the rectangular central part to reduce a diameter of the insert; and

applying a protective covering over the mounted insert.

4,639,547

MARKING DEVICE FOR USE WITH INDUCTIVE MEASURING SENSOR

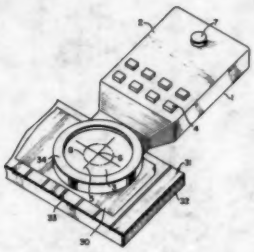
Wolfgang Jacob-Grinschgl, 40 Rumfordstrasse, D-8000 Munich, and Udo Müller, 20 b Furtweg, D-8044 Unterschleissheim, both of Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,292

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436641

Int. Cl.⁴ G08C *21/00*

U.S. Cl. 178—18 **11 Claims**



1. A marking device for marking a sheet mounted on a digitizer board of the type having a plurality of spaced, parallel conductors to which the application of current pulses in timed sequence produces a time variable magnetic flux, said marking device comprising:

a. a measuring coil having torroidal winding for receiving flux produced by said board when said coil is operatively positioned relative to said board;

b. switch means operable to cause said current pulses to be applied to said conductors on said board; and

c. marking means responsive to operation of said switch means for marking said sheet when said coil is operatively positioned relative to said board.

4,639,548

DIGITAL COMMUNICATION SYSTEM INCLUDING AN ERROR CORRECTING ENCODER/DECODER AND A SCRAMBLER/DESCRAMBLER

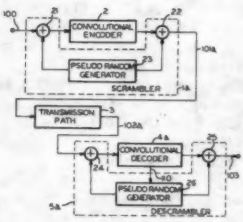
Goro Oshima, and Kotaro Kato, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Apr. 1, 1985, Ser. No. 718,725

Claims priority, application Japan, Apr. 3, 1984, 59-67237

Int. Cl.⁴ H04L *9/00*

U.S. Cl. 380/43 **10 Claims**



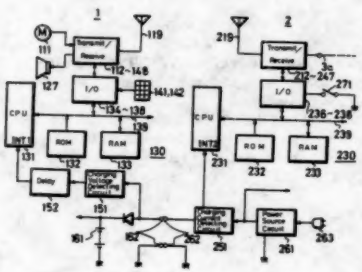
10. A method of correcting errors in scrambled digital communication, said method comprising the steps of:

(a) providing digital signals for encoding and scrambling;

(b) encoding said signals in a convolution encoder means having a transmit input and output with said transmit input coupled to receive said digital signals and said transmit output coupled to a transmission path;

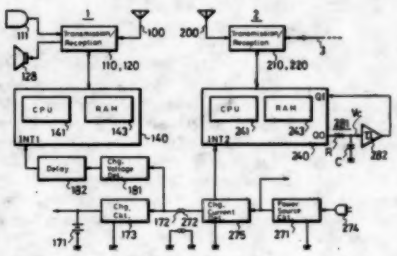
(c) scrambling said digital signals by including a first random generator means coupled between a source of said digital signals and said transmit input and between said transmit output and said transmission path whereby said scrambler means is coupled in parallel with said convolutional encoder means;
(d) transmitting said digital signals from said transmit output to said transmission path;
(e) applying signals transmitted over said transmission path to the convolution decoder means having a receive input and a receive output with said receive input being coupled to said transmission path and said receive output being coupled to a system output terminal;
(f) descrambling of said transmitted signals by including a second random generator means coupled between said transmission path and said receive input whereby a means for accomplishing said descrambling is coupled in parallel with said decoder;
(g) operating said first and second random generator means operating in the same pattern; and
(h) monitoring a code error in said decoder, thereby synchronizing said second random generator.

4,639,549
CORDLESS TELEPHONE
Shoji Hirayama, Kanagawa, and Mitsuharu Inada, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jan. 29, 1985, Ser. No. 696,183
Claims priority, application Japan, Jan. 31, 1984, 59-15451; Feb. 8, 1984, 59-21259
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—62 **18 Claims**



1. A cordless telephone, comprising:
a base unit connectable to a telephone network line for receiving and transmitting message signals therethrough;
a handset unit selectively mountable upon and separable from said base unit;
said base unit and said handset unit being adapted to preliminarily open and establish a communication channel therebetween by the transmission and reception of electromagnetic waves;
said base unit including identifying code generating means for automatically generating one of a plurality of identifying codes upon the mounting of said handset unit upon said base unit, first memory means for storing said generated identifying code, and means for initially transmitting said generated identifying code over said communication channel to said handset unit mounted thereupon;
said handset unit including second memory means for storing said identifying code initially transmitted thereto;
at least one of said base and handset units including means for transmitting over said communication channel to the other of said units the identifying code stored within the memory means of said one unit when said communication channel is preliminarily opened; and
said other unit including means for detecting when said transmitted identifying code is identical to the identifying code stored in the memory means of said other unit and for establishing said communication channel only when identity is detected.

4,639,550
CORDLESS TELEPHONE
Masato Yamagawa, Kanagawa, and Keizo Tsukada, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Apr. 12, 1985, Ser. No. 722,359
Claims priority, application Japan, Apr. 20, 1984, 59-79784
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—62 **23 Claims**

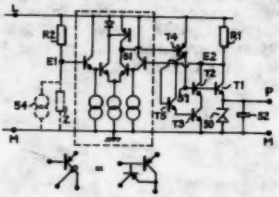


1. A cordless telephone, comprising:
a base unit connectable to a telephone network line for receiving and transmitting message signals therethrough;
a handset unit selectively mountable upon and separable from said base unit;
said base unit and said handset unit each including means for transmitting an identifying code signal over electromagnetic waves and means for receiving said transmitted identifying code signal;
said base unit including first memory means, first detecting means for generating a first detected output upon the mounting of said handset unit upon said base unit, means for automatically generating a counted value in response to said first detected output and a predetermined time associated therewith, and first means for storing said counted value as a new identifying code signal in said first memory means, said means for transmitting thereupon transmitting said new identifying code signal to said handset unit;
said handset unit including second memory means, second detecting means for generating a second detected output upon the mounting of said handset unit upon said base unit, and second means for storing said new identifying code signal in said second memory means in response to said second detected output;
said base and said handset unit each further including identity detecting means for detecting when a received identifying code signal is identical to an identifying code signal stored in said first and second memory means, respectively, and means for establishing a communication channel between said base and handset units only when identity is detected.

4,639,551
REGULATED POWER SUPPLY CIRCUIT PARTICULARLY FOR TELEPHONE SET
Jean C. Kaire, Ste Egreve, France, assignor to Thomson-CSF, Paris, France
Filed Jul. 12, 1984, Ser. No. 629,992
Claims priority, application France, Jul. 22, 1983, 83 12173
Int. Cl.[4] H04M 19/00
U.S. Cl. 323—231 **3 Claims**

1. DC voltage power supply circuit drawing its energy from

a line carrying an AC signal, including a voltage regulator configuration (50, 52) in series with a transistor (T1) controlled by a current regulator configuration (AD, R1, R2, 54), characterised in that there is also provided an assembly of second and third transistors in series (T2, T3), in parallel with the series assembly of the first transistor (T1) and of the voltage regulator configuration (50, 52), the second transistor having its base controlled like the first by the current regulator configuration



and the third having its base controlled by a means (56) of detecting the saturation of the current regulator configuration, so that a current is shunted out of the voltage regulator configuration when the input voltage of the circuit drops to a value that is too low, with respect to the output voltage of the voltage regulator configuration, for the current regulator configuration to continue to supply the voltage regulator configuration without discontinuity of current.

4,639,552

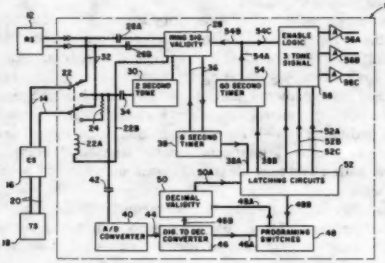
APPARATUS FOR CONVERTING A STANDARD TELEPHONE TO AN UNLISTED NUMBER TELEPHONE

Leon Hall, 1520 E. 43rd St. Tulsa, Okla. 74105

Filed Mar. 8, 1985, Ser. No. 710,003

Int. Cl.[4] H04M *1/57*

U.S. Cl. 379—199 **2 Claims**



1. Apparatus for converting a standard telephone system including a conventional telephone instrument at a transmitting station (TS) which is conventionally connected by wire conduit to a central station (CS); and a receiving station (RS) having a conventional telephone instrument connected by conventional wire line to said central station;

the improved apparatus adapted to be attached to said RS which would convert it to an unlisted number telephone, comprising:

(a) switch means adapted to switch resistive load means across said line at the RS;

(b) first validity test means capacitance coupled to the line at said RS to recognize the wave shape of a conventional ringing signal, and to determine its validity;

(c) means responsive to said first validity test means, to produce for a selected time interval a selected first tone signal and apply it to said line;

whereby responsive to receiving this first tone signal at said TS, the TS, via a DTMF system, transmits to said RS a private code which may be one or more decimal digits in a selected successive order; whereby said dialed numbers will produce a pattern of tones received at said RS;

(d) capacitive coupled to said line at said RS in an analog to digital converter means (A/DC) and digital to decimal converter means (D/DC) for producing a series of decimal digit signals which pass to a second validity check means, to check that the dialed digits are valid;

(e) a plurality of settable switches are connected serially to the output of said A/DC and D/DC;

(f) third validity test means to determine that each successive decimal digit corresponds completely to the numbers set into said successive swtiches; and means responsive to each successive validation of a switch to set a corresponding latch; and

(g) responsive to said set latches, logic means to enable one of a selected number of tone generators to apply their signals to a sound source;

whereby the operator of said RS can determine from the particular tone or tones, which one of a selective group of possible callers, the present call is from, and whether or not he wants to speak with said caller.

4,639,553

CALL SIGNAL DETECTING DEVICE

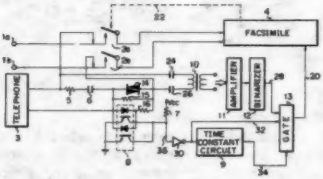
Masao Kiguchi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 9, 1985, Ser. No. 721,406

Claims priority, application Japan, Apr. 9, 1984, 59-69245

Int. Cl.[4] H04N *1/32*

U.S. Cl. 379—377 **3 Claims**



1. A call signal detecting device connected to a telephone line together with a telephone set for identifying an unsounding call signal and a sounding call signal which are received over the telephone line, said call signal detecting device comprising:

first binarizer means for converting a frequency signal received over the telephone line to two binary levels and providing a first output;

second binarizer means for converting a sounding call signal received over the telephone line to two binary levels and providing a second output;

selector means for selectively delivering said outputs of said first and second binarizer means wherein the selector means selects said second output and the second binarizer means has received said sounding call signal; and

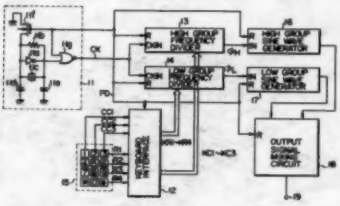
signal identifying means for identifying an unsounding call signal and a sounding call signal by measuring a period of a signal delivered from said selector means.

4,639,554

DUAL-TONE MULTIPLE-FREQUENCY-SIGNAL GENERATING APPARATUS

Eiji Masuda, Kawasaki, and Yasuhiko Fujita, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1984, Ser. No. 685,834
Claims priority, application Japan, Dec. 26, 1983, 58-244116; Dec. 26, 1983, 58-244117; Dec. 26, 1983, 58-244118
Int. Cl.[4] H03K 1/16; G06F 15/20
U.S. Cl. 340—365 S 34 Claims



1. A dual-tone multiple-frequency-signal generating apparatus, comprising:

key input means in which keys are arranged in a matrix;

reference-frequency-signal generating means for generating a reference frequency signal;

frequency dividing means for dividing the reference frequency signal from said reference-frequency-signal generating means corresponding to a key actuated by said key input means and for producing first and second frequency-divided signals;

sine-wave-signal generating means for generating respective first and second sine wave signals having approximately the same cycles as those of first and second standard frequencies using the first and second frequency-divided signals from said frequency dividing means;

first level converting means with high input impedance for receiving and level converting the first sine wave signal;

second level converting means with high input impedance for receiving and level converting the second sine wave signal; and

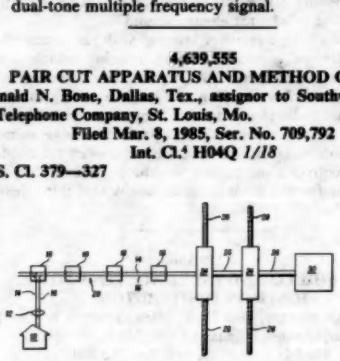
output-signal-mixing means connected to said first and second level converting means for combining the first and second level converted sine wave signals produced from said first and second level converting means to produce a dual-tone multiple frequency signal.

4,639,555

PAIR CUT APPARATUS AND METHOD OF USE

Ronald N. Bone, Dallas, Tex., assignor to Southwestern Bell Telephone Company, St. Louis, Mo.

Filed Mar. 8, 1985, Ser. No. 709,792
Int. Cl.[4] H04Q 1/18
U.S. Cl. 379—327 13 Claims



1. A method of restoring service in telephone networks in which a fault has occurred between a field box and a central office wherein said networks contain pairs of wires which originate at a customer's premises; field connection boxes which connect pairs of wires; and cable protector blocks on a central office distributing frame which contain protectors having means for connecting with corresponding receptacles on said protector block wherein each protector connects a pair of wires from the field with its corresponding pair of office wires comprising:

(a) in a field box, which is located between the customer's premises and the fault, connecting the non-functioning pair of wires which runs towards the customer's premises and which has been assigned to the customer to a second unassigned functioning pair of wires which runs to the central switching office;

(b) removing the protector on the cable protector block from the non-functioning pair of wires which has been assigned to said customer and from said second unassigned functioning pair of wires;

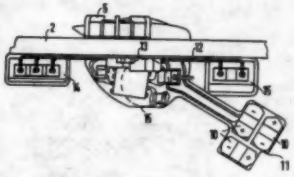
(c) with a connecting cable which has connectors on each of its ends, connecting one end of said cable with the receptacles on the cable protector block that corresponds to the office wires of the non-functioning pair of wires which has been assigned to said customer and connecting the other end of said cable with the receptacles on the cable protector block that correspond to the field wires of said second unassigned pair of wires.

4,639,556

HEARING AID WITH A FLEXIBLE PRINTED CIRCUIT BOARD

Christof Härtl, Neunkirchen, and Hans Wagner, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,387
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336266
Int. Cl.[4] H04R 25/02, 25/00
U.S. Cl. 381—68.6 6 Claims



1. A hearing aid for insertion into a user's outer auditory canal, comprising:

a housing including an end plate;

a flexible printed circuit comprising component zones to which electrical components are mounted and bending zones which are devoid of electrical components; and

a user-operated control element located on the end plate of the housing and fastening the circuit to the end plate inside the housing.

4,639,557

REMOTE TESTING SYSTEM FOR ELECTRICAL CIRCUITS

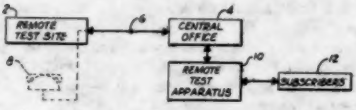
Myron C. Butler, Edmond, Okla.; William R. Hilligoss, and Lawrence O. Hilligoss, both of Ashland, Oreg., assignors to Communications Technology Corporation, Los Angeles, Calif.

Filed Sep. 27, 1985, Ser. No. 781,412
Int. Cl.[4] H04B 3/46
U.S. Cl. 379—29 20 Claims

1. A test system for testing from a test site a selectable one of a plurality of electrical circuits, comprising:

testing means, connectible to the plurality of electrical circuits, for receiving a control signal from the test site and for generating and applying a test signal to the one of the

plurality of electrical circuits selected in response to the control signal from the test site; and



synthesized voice means, connected to said testing means, for generating audible speech signals to verbally communicate a result from said testing means to the test site.

4,639,558

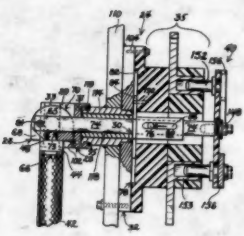
REVERSING SWITCH

Jennings Lycan, Huntington, W. Va., assignor to Service Machine Co., Huntington, W. Va.

Filed Jan. 2, 1986, Ser. No. 815,520

Int. Cl.[4] H01H *9/00*

U.S. Cl. 200—1 V **11 Claims**



1. In a reversing switch having an enclosure with a hub extending through a wall thereof, a shaft extending through said hub and being journaled therein for rotational and axial movement, stationary contact means circumferentially spaced within said enclosure, moveable contact means supported by said shaft and rotatable therewith in the axially displaced position to engage said stationary contact means in forward and reverse modes at opposite ends of a range of rotation of said shaft, an operator member at the forward end of the hub through which said shaft is axially and rotatably journaled, handle means connected to said shaft and having means engageable with said operator member to move said shaft back and forth longitudinally to open and close said contact means in response to backward and forward swinging movement of said handle means, said shaft and moveable contact means being rotatable by said handle means between selected positions prior to axial displacement to close said contact means, the improvement comprising: means interconnecting the operator member and hub preventing fore and aft movement of the operator member relative to the hub while enabling rotation of the operator member about the hub.

4,639,559

MEMBRANE KEYBOARD

Toshimichi Taguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

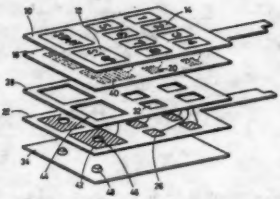
Continuation of Ser. No. 461,148, Jan. 26, 1983, Pat. No. 4,555,601. This application May 7, 1985, Ser. No. 731,273

Claims priority, application Japan, Jan. 29, 1982, 57-13679; Jan. 29, 1982, 57-13680

The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.

Int. Cl.[4] H01H *13/70*

U.S. Cl. 200—5 A **1 Claim**



1. A membrane keyboard comprising:

a first flexible sheet having key pad lables formed thereon, said key pad labels including at least one larger size key pad label and at least one smaller size key pad label;

a second flexible sheet disposed below said first flexible sheet, said second flexible sheet carrying conductor electrodes formed on the rear surface thereof, each of said conductor electrodes having a size substantially identical to the corresponding key pad label formed on said first flexible sheet;

a third flexible sheet disposed below said second flexible sheet, said third flexible sheet carrying counter conductor electrodes formed on the front surface thereof, each of said counter conductor electrodes having a size substantially identical to the corresponding conductor electrode formed on the rear surface of said second flexible sheet;

a spacer sheet disposed between said second and third flexible sheets, said spacer sheet including:

large and small openings formed at positions corresponding to the conductor electrodes formed on the rear surface of said second flexible sheet, each of said openings having a size substantially identical to the corresponding conductor electrode; and

a partition bridge member integral with the spacer sheet and formed across the larger opening which corresponds to said larger size key pad label, said partition bridge member dividing the larger opening into two sections, whereby additional support provided for said second flexible sheet by said partition bridge member prevents an erroneous connection between the conductor electrodes and counter conductive electrodes;

and a reinforcing plate disposed below said third flexible sheet.

4,639,560

SPARK SHIELD AND INLET AIR VENT FOR AN IGNITION DISTRIBUTOR

Leonard J. Kronberger, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

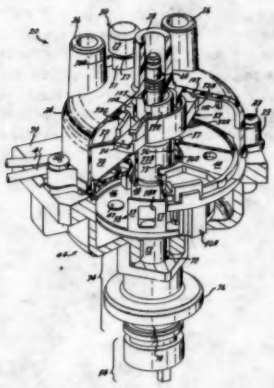
Filed Oct. 1, 1985, Ser. No. 782,760

Int. Cl.[4] F02P *1/00*; H01H *19/00*

U.S. Cl. 200—19 R **2 Claims**

1. For an internal combustion engine with cylinders, an ignition distributor including a distributor cap, a rotor, spark plug electrodes, a coil electrode, a shaft, a bowl shaped housing, a switch plate assembly with mating pockets, an interrupter and a rotor electrode, a spark shield comprising:

a circular shaped membrane of a generally domed shape;
radial stiffening ribs projecting from the outer circumferential edge of the circular membrane;
the membrane having an opening at its center into which the radial stiffening ribs terminate; and



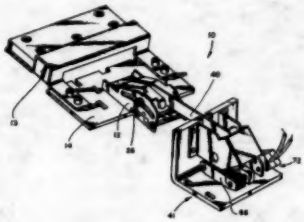
mating means located on the outer circumferential edge of the circular membrane for communication with the switch plate assembly.

4,639,561

MECHANICAL TIME DELAY MECHANISM

Aymon A. Maulandi, Cedar Rapids, Iowa, assignor to Square D Company, Palatine, Ill.

Filed Dec. 18, 1984, Ser. No. 683,092
Int. Cl.[4] H01H 7/00
U.S. Cl. 200—33 R 13 Claims



1. A time delay mechanism displacing a second member after a predeterined time delay and in response to the displacement of a first member being located adjacent said mechanism, the second member also being located adjacent said mechanism, said mechanism comprising:
a link having a first end and a second end, said first end connected with the first member;
delay means for delaying movement of the link in response to displacement of the first member;
a wheel rotatably mounted about an axle, said wheel having a point spaced apart from said axle, said wheel connected at said point to the second end of said link, said wheel rotating in response to movement of said link;
slow means for slowing the rotation of said wheel; and
a pin mounted on said wheel, said pin being adapted to displace the second member upon the rotation of the wheel through a predetermined angle.

4,639,562

KEY LOCK SWITCH WITH ANTISTATIC MEANS

Eric Fredrickson, W. Bridgewater, Mass., assignor to C&K Components, Inc., Newton, Mass.

Filed Nov. 14, 1984, Ser. No. 671,409
Int. Cl.[4] H01H 27/06
U.S. Cl. 200—43.08 9 Claims

1. A lock actuated switch comprising a lock, a key, a midplate, and a switch, the lock including a lock cylinder and a shell, the lock cylinder having a body portion, the body portion having a flange extending therefrom and a stop portion extending therefrom and including a key hole and an activating means, the activating means extending from the lock cylinder, having a free terminal end and having a logitudinal axis, the key engageable in the key hole and adapted on movement to rotate the activating means, the midplate comprises a top surface, a mid-surface, a lower surface and a centrally located through aperture, the lower surface having a tubular element extending therefrom forming a continuation of the aperture and is coaxial therewith, an antistatic wall extends away from the lower surface, circumscribes the tubular element in spaced relation, in spaced from the periphery of the lower surface, has a bottom surface and extends beyond the horizontal plane of the lower surface, the shell having a wall defining a through, longitudinal bore having a recess formed therewith, the body portion fitted within the bore and the stop portion positioned within the recess, the switch includes a tubular engagement portion extending therefrom and an engagement wall defining a circular configuration, the tubular element circumscribing the engagement portion, the engagement wall circumscribing the tubular element and the antistantic wall circumscribing the engagement wall, the tubular element and the antistatic wall of the midplate associated with the lock and the switch and positioned between the lock and the switch, the midplate operationally engaged with the switch and the lock, the switch having an actuating means and the activating means engaging the actuating means whereby rotation of the key will actuate the switch and will move the stop portion within the recess.

4,639,563

ACCELERATION AND DECELERATION SENSOR

Walter Günther, Nürnberg, Fed. Rep. of Germany, assignor to W. Günther GmbH, Nürnberg, Fed. Rep. of Germany

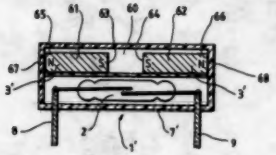
Filed Oct. 22, 1984, Ser. No. 663,185
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338287
Int. Cl.[4] H01H 35/14
U.S. Cl. 200—61.45 M 4 Claims

1. An acceleration and deceleration sensor, comprising:
a first abutment;

a second abutment spaced apart from said first abutment by a fixed distance;

a first permanent magnet slidably mounted between said first and second abutments;

a second permanent magnet slidably mounted between said first permanent magnet and said second abutment, said second permanent magnet being oriented to magnetically repel said first permanent magnet, so that mutual magnetic



repulsion forces said first permanent magnet against said first abutment and forces said second permanent against said second abutment except when the sensor undergoes acceleration or deceleration; and

a reed switch mounted adjacent said magnets, said reed switch being responsive to magnet position in order to sense an acceleration or deceleration which forces one magnet toward the other despite the repelling force.

4,639,564

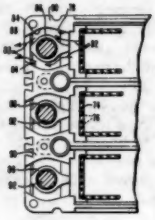
CIRCUIT BREAKER WITH ARC CHAMBER VENT

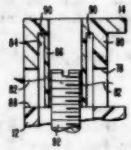
Kurt A. Grunert, Beaver Boro; Roger E. Walker, Franklin Township, Beaver County; Charles R. Paton, New Brighton, and David A. Leone, Center Township, Beaver County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1985, Ser. No. 729,437

Int. Cl.[4] H01H *33/04*

U.S. Cl. 200—144 R **7 Claims**





1. A circuit breaker with arc chamber vent, comprising:

an electrically insulated housing including line and load terminals;

an arc quenching chamber within the housing;

a circuit breaker structure within the housing and having stationary and movable contacts operable between open and closed positions in an arcing zone within the chamber;

the contacts forming a circuit breaker path between the terminals;

operating means for actuating the contacts;

the housing having wall means forming a compartment for containing each terminal and having a first opening between each pair of corresponding chambers and compartments;

the wall means also forming second openings on the side of the chamber opposite the first openings, and

the wall means also forming a tubular wall around the terminal and between the first and second openings for isolating the terminal from any arc gases venting from the chamber and through the compartment to ambient air, thereby avoiding an electrical breakdown between the terminal and any proximate electrical conductor.

4,639,565

HIGH TENSION ARC-BLAST CIRCUIT BREAKER

Van Doan Pham, Meyzieu, France, assignor to Alsthom-Atlantique, Paris, France

Filed May 21, 1985, Ser. No. 736,505

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A **4 Claims**

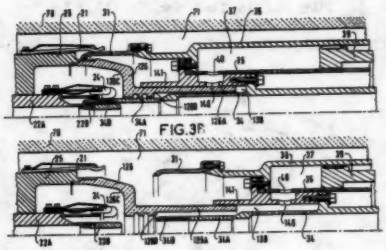


FIG. 3

1. In a high tension arc-blast circuit breaker comprising at least one circuit breaker for breaking one phase of a polyphase current and disposed inside an insulating or metal envelope (70), said circuit-breaking device comprising a fixed first assembly having fixed main contacts (21) and fixed anti-sparking contacts (24, 22B), and a moving second assembly having moving main contacts (31) and moving anti-sparking contacts (34B), the fixed assembly including a first volume (27) in which pressure is increased under the effect of the breaking arc, the gas in said volume expanding via a first nozzle (26A) to blast the arc at a zero crossing in the current to be broken, the second moving assembly including a second volume (37) in which the gas is compressed by a piston at the beginning of the circuit breaker opening phase and is directed onto the arc via a second nozzle (42A) during the later phases, the improvement comprising interengaging means carried by said nozzles (26A, 42A) which remain in contact over the full extent of relative movement between said nozzles to prevent any direct passage of blast gases into the volume (71) lying between said assemblies and said envelope.

4,639,566

DIP SWITCH ASSEMBLY HAVING SIDE EXTENDING LEADS

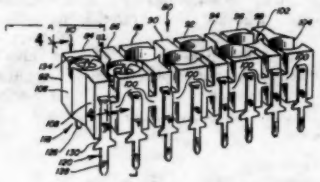
Lon DeHaitre, Arlington Heights, Ill., assignor to Abbott-Interfast Corporation, Wheeling, Ill.

Continuation-in-part of Ser. No. 686,290, Dec. 26, 1984, abandoned, which is a continuation of Ser. No. 484,896, Apr. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 331,235, Dec. 16, 1981, Pat. No. 4,403,126. This application Apr. 4, 1985, Ser. No. 719,919

The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.

Int. Cl.[4] H01B *3/40*; H01H *1/02*; H01R *9/00*

U.S. Cl. 200—158 12 Claims



1. A switch assembly comprising:

a body of electrically insulative material molded to provide a strip of integrally formed, joined segments arranged in side-by-side alignment, each segment having a top surface, a bottom surface, lateral side surfaces, and two opposed ends;

each segment presenting a pair of horizontally extending passageways opening to said side surfaces, and each segment presenting a vertical socket open to the top surface, the sockets of respective segments being arranged adjacent alternating ends of said adjacent segments, the passageways in adjacent segments being spaced apart at a standard distance;

a pair of conductive stakes in each segment, one stake being inserted in each passageway of each said segment and each stake presenting a top contact portion formed to be adjacent to and spaced from the socket of that segment to form a pole of a switch so that the top portions of the two stakes inserted in the two passageways of each segment form two spaced poles of a switch;

each segment having a headed screw inserted in said socket and forming a bridging member extending between said two poles, said screw capable of being rotated between an engaged position in which the screw head makes electrical contact between the poles of said segment to close the switch of that segment and a disengaged position in which the screw head is free of said poles to open the switch of that segment;

there being connecting webs between every pair of adjacent segments formed about the median horizontal plane of the segments, the connecting webs having a height less than the distance between the segment top and bottom surfaces and a width much less than the distance between the segment ends;

each said pair of stakes forming a pair of opposed leads having said contact portions thereof integrally molded in said body, and central portions that extend substantially perpendicularly out of said body respectively at said two sides of the body and that are bent downwardly at approximately right angles to said contact portions, and each of said leads having end portions terminating said leads opposite said contact portions, the distance between lead end portions of adjacent pairs of leads being a standard distance, and the distance between lead end portions of each pair of leads also being a standard distance.

4,639,567

METHOD AND APPARATUS FOR MELTING ROD-SHAPED MATERIAL WITH AN INDUCTION COIL

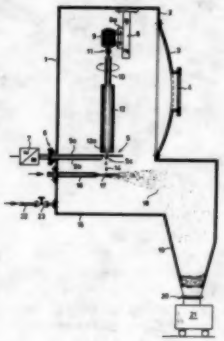
Otto Stenzel, Gründau, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Sep. 11, 1985, Ser. No. 774,918

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433458

Int. Cl.[4] H05B *6/40*

U.S. Cl. 219—10.43 12 Claims



1. A method for drip-melting rod-shaped material comprising:

continuously displacing rod-shaped material in the direction of the rod axis towards an induction coil arranged at the lower end of the rod coaxially therewith, supplied with an alternating current and having an opening, the axial dimension of the induction coil being several times smaller than the diameter of the rod-shaped material, and causing melt of the rod-shaped material freely to fall in liquid form through the opening of the induction coil by holding the lower end of the rod-shaped material with its end face at a substantially constant axial spacing above the induction coil.

4,639,568

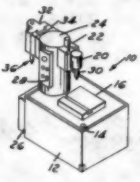
APPARATUS AND METHOD FOR FINISHING FUEL INJECTOR SPRAY TIPS USING EDM

John M. Check, Chelsea, and Myron C. Johnson, Freeland, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 13, 1984, Ser. No. 630,809

Int. Cl.[4] B23H *7/00, 9/10*; B21K *1/24*; F02M *55/00*

U.S. Cl. 219—69 M 8 Claims



5. A method for producing a dripless fuel sack volume in a fuel injector spray tip having a bore terminating at a frusto-conical surface with a blunt end surface comprising the steps of: cold deforming the blunt end surface and frusto-conical surface to produce a V-shaped electrode tip relief space and a near net shape valve seat, and thereafter non-contact machining the valve seat by use of a V-shaped electrode having its tip configured to be spaced from the tip at the relief space thereby to form a finished valve tip interior that accommodates a

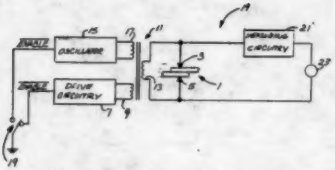
needle valve component while defining a reduced volume fuel cavity to reduce fuel dribble when the valve is closed.

4,639,569

WELD RESISTANCE MEASURING APPARATUS FOR A SPOT WELDER

Gerald Dufrenne, LaVerne, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Apr. 1, 1985, Ser. No. 718,295
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—109 **22 Claims**



8. In a spot welder having drive circuit means and welding electrodes for connection to each of a group of weld sites that are subject to variation with respect to weld resistance, the drive circuit means having an output for supplying welding current through the welding electrodes to the connected weld site, apparatus to selectively supply welding current or alternating current for measuring weld resistance of the connected weld site, the improvement which comprises:

(a) measuring circuit means having an input for connection in parallel with the weld site and said output;

(b) test-signal-generating means for inducing a flow of alternating current through the weld site such that the percentage variation in the magnitude of the alternating current is substantially less than the percentage variation to which resistance weld sites are subject; and

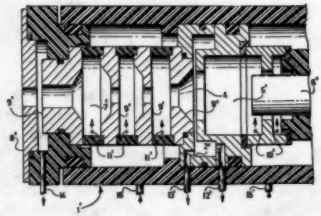
(c) the measuring circuit means including means responsive to voltage developed at said input as a result of the flow of the alternating current through the weld site for producing a signal representative of the magnitude of the resistance of the weld site.

4,639,570

APPARATUS FOR STABILIZATION OF LOW-TEMPERATURE PLASMA OF AN ARC BURNER

Karel Zverina, No. 4 U kola, Praha 4; Denek Tluchor, No. 4 Drevna, Praha 2; Josef Szabo, No. 4 Ripska, Praha 10; Jaromir Polidor, No. 43 Ovenecka, Praha 7, and Petr Kroupa, No. 540 Fertekova, Praha 8, all of Czechoslovakia

Division of Ser. No. 466,648, Feb. 15, 1983, Pat. No. 4,531,043. This application Feb. 8, 1985, Ser. No. 699,654
Claims priority, application Czechoslovakia, Feb. 15, 1982, 1023-82; Feb. 15, 1982, 1024-82
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 PP **1 Claim**



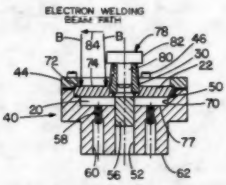
1. In a liquid stabilized plasma burner containing a discharge chamber which surrounds a rod-like cathode, a front nozzle, and a stabilization channel disposed between said discharge chamber and nozzle, the improvement wherein between the discharge chamber and the stabilization channel there is disposed a transition space, said transition space separating said discharge chamber and said stabilization channel, said discharge chamber having disposed therein at least one tangential inlet for a first stabilization liquid which is adapted to be introduced into said discharge chamber, and said stabilization channel having disposed therein at least one tangential inlet for a second stabilization liquid which is adapted to be introduced into said stabilization channel, and said transition space having arranged therein at least one outlet for the stabilization liquids, first conduit means externally connected to said burner for supplying a first stabilization liquid to the tangential inlet of said discharge chamber, second conduit means externally connected to said burner for supplying a second stabilization liquid to the tangential inlet of said stabilization channel, said first and second conduits being independent of each other, and an orifice plate arranged between the discharge chamber and stabilization channel, said orifice plate forming two circumferential slot outlets on respective opposite sides of said orifice plate, the first and second stabilization liquids flowing in opposite axial directions.

4,639,571

METHOD OF BEAM WELDING METALLIC PARTS TOGETHER AND APPARATUS FOR DOING SAME

Edward F. Lewandowski, Westmont, Ill.; Dale A. Cassidy, Valparaiso, Ind., and Robert G. Sommer, Lemont, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1985, Ser. No. 802,874
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EC **15 Claims**



1. A method of welding an elongated metallic piece to one side of a metallic plate from the opposite other side of such plate, such method comprising the steps of

temporarily clamping the elongated piece to such one side of the plate while leaving the opposite side of the plate exposed,

the clamped piece and plate initially having an interface tracing an elongated path therebetween with interstices along the plate,

providing a heat conductive heat sink material, and configuring such material to engage such piece, and such plate on the one side, each at locations proximate to but spaced from the interface,

subjecting the other side of such plate to an electron welding beam, focused narrowly at and in registry opposite to the elongated clamped piece,

moving the electron welding beam along the elongated path in opposite registry to the elongated clamped piece,

the electron welding beam being supplied with adequate energy for penetrating through the plate, across the interface, and into the piece,

whereby the electron welding beam produces molten material from the plate and piece at the interface,

the heat sink material sufficiently cooling the plate and piece proximate to but not at the interface, and preventing thereby the molten material from extruding from the

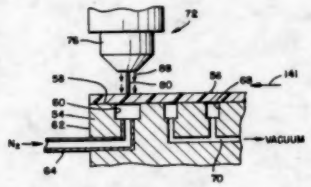
interface, but instead of filling the interstices and providing a welded joint substantially void of interstices.

4,639,572

LASER CUTTING OF COMPOSITE MATERIALS

Boris Gruzman, Binghamton, and Carl-Otto Nilsen, Vestal, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,606
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LG **19 Claims**



1. A method of laser cutting of sheet material while minimizing oxidation thereof comprising the steps of:

directing a laser beam at a first surface of the sheet material;

selectively moving the beam and the sheet material relative to one another to thereby cut the sheet material;

isolating in an atmosphere of inert gas a second surface of the sheet material opposite the first surface and proximate to the anticipated cut line to be made by the laser beam; and

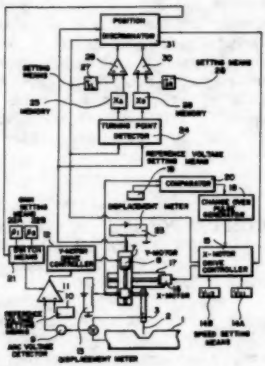
simultaneously directing a cylindrical jet of inert gas against the first surface of the sheet material at which the laser beam is directed, the jet of inert gas being coaxial with the laser beam to thereby isolate a region of the first surface surrounding the location at which the laser beam strikes the first surface.

4,639,573

AUTOMATIC GROOVE TRACING CONTROL METHOD FOR ARC WELDING

Yuji Sugitani, and Naohiro Tamaoki, both of Tsu, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,169
Claims priority, application Japan, Jul. 4, 1984, 59-137245
Int. Cl.⁴ B23K *9/12*
U.S. Cl. 219—124.22 **4 Claims**



1. In an automatic groove tracing control method for arc welding in which during arc welding of a groove of a pair of metals to be welded a welding torch is moved in its axial direction so as to maintain an arc voltage or welding current at a predetermined value and thereby maintain an arc length constant and said torch is caused to weave in a width direction of said groove with respect to a direction of welding while changing the direction of said weaving each time a displacement or position of said torch in said torch axial direction attains a predetermined value thereby effecting an automatic tracing control of said torch during said arc welding, the improvement comprising the steps of:

detecting positions of terminal ends of each cycle of said weaving from a weaving stroke of said torch in said groove width direction;

establishing a predetermined small area on each side of a central portion of said groove in accordance with said terminal ends;

increasing a first travel speed of said torch in said torch axial direction and decreasing a second travel speed of said torch in said groove width direction each time the weaving position of said torch in said groove width direction enters each of said small areas from said groove central portion;

restoring said second travel speed to its initial value when the direction of said weaving is reversed; and

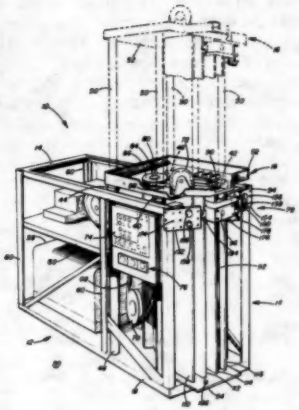
restoring said first travel speed of said torch to its initial value when said torch emerges from each said small area and enters said groove central portion.

4,639,574

AUTOMATIC DUCT WELDING MACHINE

Peter J. Arnoldt, Clairton, and Fredrick J. Arnoldt, Bethel Park, both of Pa., assignors to Ductmate Industries, Inc., Pittsburgh, Pa.

Filed Oct. 19, 1984, Ser. No. 662,956
Int. Cl.⁴ B23K *9/12, 37/02*
U.S. Cl. 219—125.1 **20 Claims**



1. Apparatus for welding sheet member edges together to form a duct section comprising,

a machine frame, said machine frame having a stationary portion and a movable portion, said movable portion being vertically movable relative to said stationary portion between an upper unloading position offset from said stationary portion and a lower welding position telescoping with said stationary portion,

said stationary portion including an abutment member with a surface defining a V-groove or U-channel for supporting a pair of adjacent longitudinal sheet member edges at a preselected angle to maintain the adjacent longitudinal sheet member edges positioned in abutting relation,

clamp means positioned on said frame movable portion to move toward and away from said abutment member for

engaging and disengaging the sheet member edges with said abutment member surface,

a welding machine including a welding gun positioned on said frame movable portion,

guide means positioned on said frame movable portion in facing relation to said V-groove or U-channel for supporting said welding gun for longitudinal movement on said frame movable portion along a path facing said V-groove or U-channel for welding together in abutting relation said longitudinal sheet member edges,

actuating means mounted on said machine frame for moving said welding gun along said guide means the length of the abutting sheet member edges positioned in engagement with said abutment member surface, and

control means for actuating said welding machine upon movement of said welding gun to form a continuous welded seam sealingly connecting the abutting sheet member edges.

13. A method for connecting sheet member edges with internal welding in the formation of duct work of polygonal or circular cross-section comprising the steps of,

positioning a body of sheet material arranged to have an outline of a duct portion having a pair of adjacent longitudinally extending sheet member edges on a fixed frame,

supporting the pair of longitudinal sheet member edges on the fixed frame so that the adjacent sheet member edges are positioned in abutting relation,

clamping the pair of sheet member edges in said abutting relation to said fixed frame by moving clamp means outward toward said longitudinal sheet member edges,

mounting a welding gun within said body in position opposite to the abutting sheet member edges for linear movement along the length of the sheet member edges,

moving the welding gun in a linear path within said body and parallel to the abutting sheet member edges,

actuating the welding gun when the welding gun reaches a first position in said linear path opposite to the upper end of the abutting sheet member edges,

welding together the pair of sheet member edges upon movement of the welding gun along said linear path, and

stopping the movement of the welding gun and interrupting the welding operation when the welding gun moves to a second position in said linear path opposite to the lower end of the abutting sheet member edges to form a continuous weld extending along the pair of sheet member edges to weld said abutting edges together to complete said duct portion.

4,639,575

THREE O'CLOCK NARROW GROOVE WELDING APPARATUS

Isao Asano, Kure, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 317,544, Nov. 2, 1981, Pat. No. 4,504,729. This application Jan. 23, 1984, Ser. No. 573,130

Claims priority, application Japan, Nov. 5, 1980, 55-154702; Nov. 11, 1980, 55-157742

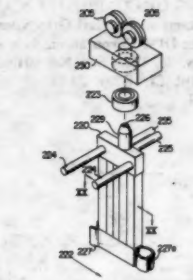
Int. Cl.[4] B23K *9/00*

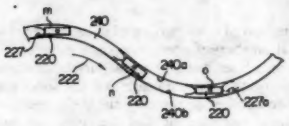
U.S. Cl. 219—136 **4 Claims**

1. An apparatus for three o'clock welding in a narrow groove wherein welding is carried out by moving a welding torch in a space in a groove having a center line in the form of a curve displaced in the horizontal direction and/or in the vertical direction, comprising:

a welding head for feeding a welding wire;

a welding torch provided with a contact means and mounted on the welding head so that the torch is freely rotatably movable with respect to the welding head by a force applied thereto from the wall of the groove, with a center of the rotatable movement being that of the contact means; and





means for moving said welding torch along the space in the narrow groove at all times.

4,639,576

WELDING ELECTRODE

Lewis E. Shoemaker, and Thomas O. Bates, both of Huntington, W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Continuation of Ser. No. 714,988, Mar. 22, 1985, abandoned. This application May 30, 1986, Ser. No. 871,128

Int. Cl.[4] B23K *35/22*

U.S. Cl. 219—146.23 **6 Claims**

1. A consumable electrode for welding a 625 alloy clad steel workpiece, the electrode including a core wire and a coating, the core wire consisting essentially of about 20% to about 23% chromium, about 8% to about 10% molybdenum, up to about 5% iron, up to about 1% cobalt, up to about 0.5% silicon, up to about 0.4% aluminum, up to about 0.4% titanium, about 3% to about 4% columbium plus tantalum, the balance nickel and trace impurities, and the coating consisting essentially of about 10% to about 40% calcium carbonate, about 10% to about 35% cryolite, about 10% to about 30% titanium dioxide, up to about 10% magnetite, about 6% to about 12% molybdenum, up to about 7% nickel-columbium, up to about 10% chromium, up to about 15% nepheline syenite, up to about 5% zirconium oxide, up to about 5% periclase, up to about 5% extrusion aids, and a binder.

4,639,577

ELECTRODES FOR ENHANCED HEAT AND MASS TRANSFER APPARATUS

Eugene J. Sturdevant, Berwyn, Pa., assignor to Harry Hill Associates, Philadelphia, Pa.

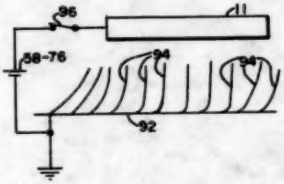
Filed Jul. 3, 1985, Ser. No. 752,367

Int. Cl.[4] H05B *3/62;* **H01T** *19/04*

U.S. Cl. 219—399 **16 Claims**

1. An improved corona generation electrode configuration for use in a device for enhancing heat and mass transfer, employing corona discharge, wherein the corona generation electrode and another body providing a second electrode are able to produce corona discharges between them, comprising providing said corona generation electrode with a plurality of corona discharge generators with pointed or small diameter

free ends fixed at their opposite ends to a common conductive base wherein the corona generation electrode employs a plurality of flexible self-adjusting corona discharge generators having at least a current conducting capability and each of



which is connected to the conductive base so as to yield under mechanical pressure but return to operative position upon imposition of a corona producing potential and to individually yield to varying electrostatic forces during operation.

4,639,578

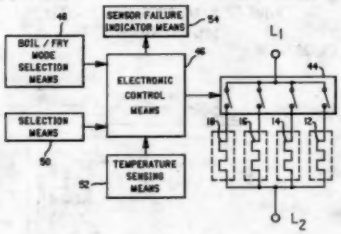
TEMPERATURE SENSOR FAILURE DETECTION SYSTEM FOR COOKING APPLIANCE

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 6, 1986, Ser. No. 816,615

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—450 **20 Claims**



1. In a cooking appliance of the type having heater means for heating a cooking utensil, user input selection means for enabling the user to select a desired heating level for said heater means, and temperature sensing means operative to sense the temperature of the utensil being heated by said heater means, an improved control arrangement comprising:

control means responsive to the temperature sensing means and the user input selection means, operative under normal operating conditions to control energization of the heater means in accordance with a closed loop control strategy as a function of a sensed utensil temperature and the user selected setting;

said control means including means for detecting an abnormal operating condition for said temperature sensing means;

said control means being operative in response to detection of said abnormal condition to operate said heater means in accordance with an open loop control strategy as a function of the user selected setting independently of the sensed temperature, whereby the closed loop temperature control arrangement converts to an open loop power control arrangement upon detection of a temperature sensing means failure.

4,639,579

HEATING APPARATUS

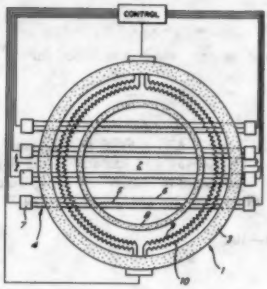
Steve M. Brooks, Essex, and David R. May, Cheshunt, both of England, assignors to Thorn EMI Domestic Appliances Limited, London, England

Filed May 14, 1985, Ser. No. 733,802

Claims priority, application United Kingdom, May 15, 1984, 8412339

Int. Cl.⁴ H05B *3/68*

U.S. Cl. 219—464 **5 Claims**



1. A heating unit suitable for mounting in a cooking hob, said unit comprising:

a base layer of thermally-insulative material;

a peripheral thermally-insulative wall defining a first hotplate region;

an inner thermally-insulative wall defining a second hotplate region located within said first region;

an electrical heating element; means for supporting said heating element between said inner and peripheral walls adjacent said base layer,

a lamp emissive of infra-red radiation and having first and second ends, said lamp comprising a tubular envelope and a linear filament supported in said envelope;

means for supporting said lamp such that said envelope extends across said first hotplate region and said first and second ends are located outside of said first region, said filament being of length commensurate with said second hotplate region; and

means, connectable to said lamp and said heating element, for energising the filament and the heating element independently and concurrently, selectively.

4,639,580

COUPLING DEVICES FOR USE WITH ELECTROFUSION FITTINGS OF THERMOPLASTIC MATERIAL

Alan Johnson, Sunderland, England, assignor to British Gas Corporation, London, England

Filed Dec. 17, 1984, Ser. No. 682,184

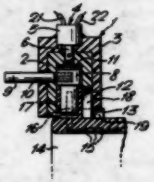
Claims priority, application United Kingdom, Dec. 16, 1983, 8333550

Int. Cl.⁴ H05B *3/08*

U.S. Cl. 219—541 **12 Claims**

1. A coupling device for use with an electrofusion fitting of thermoplastic material comprising; identifying means in the form of shaped portions carried by the fitting and arranged in a predetermined formation representative of that fitting; and separate connector means having indicator means selectively operable by said connector means when the connector means is brought into register with said identifying means so as to

provide an indication of the identity of the fitting and the optimum period and value of electrical energisation of its



resistance heating wire winding required for satisfactory electrofusion.

4,639,581

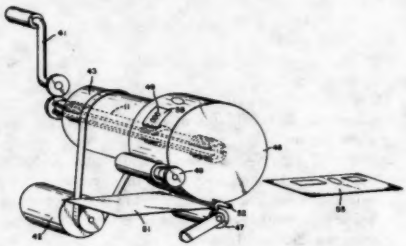
INSTRUMENT AXLE FOR POSTAGE METER

Erwin Berger, Thörishaus, and Rudolf Grünig, Schliern, both of Switzerland, assignors to Hasler AG Bern, Bern, Switzerland

Filed Dec. 20, 1984, Ser. No. 684,277

Int. Cl.[4] G06F *1/106*

U.S. Cl. 235—101 **19 Claims**



1. A postage meter machine comprising

a rotary drive;

an axle constructed of a metallic core force transmittingly connected to the rotary drive; arms forming part of the core of the axle with the core defining an H-shaped cross-section with two grooves between said arms of the H; a jacket of a plastic material surrounding the core; centered circular bearing flanges attached to the axle formed of a material corresponding to the jacket material; transporting means driven by the axle for moving mail pieces through the postage meter machine; a system for setting and printing numerals onto the mail pieces coordinated to the mail pieces moving through the postage meter machine.

4,639,582

CIRCULATING-TYPE BILL DEPOSITING AND DISBURSING MACHINE

Junichi Arikawa; Hiroshi Chiba, both of Urawa; Osamu Miyazaki, Kawaguchi, and Masatoshi Osanai, Urawa, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

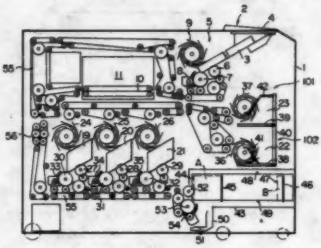
Filed May 14, 1985, Ser. No. 733,786

Claims priority, application Japan, May 16, 1984, 59-98292; May 16, 1984, 59-98293

Int. Cl.[4] G06F *15/30*

U.S. Cl. 235—379 **6 Claims**

1. A circulating-type bill depositing and disbursing machine allowing received bills to be reused as dispensable ones, comprising: a first and second storing parts for storing the received bills after sorting the same into undamaged and damaged bills; a depositing and disbursing box for storing the undamaged and damaged bills in said first and second storing parts and for using only the undamaged bills stored as dispensable ones; and a disbursing bill storing section divided into denominations for accumulating the undamaged bills dispensed from said depositing and disbursing box and for dispensing bills according to the amount of money specified to be disbursed, said first and second storing parts being provided in the front and vertical positions of a machine body and being provided with a storing



front plate and a holding plate capable of reciprocating vertically between the same and said depositing and disbursing box and of clamping the undamaged and damaged bills in an upright position, as well as a storage bottom plate for supporting the undamaged and damaged bills which is coupled with said storing front plate.

4,639,583

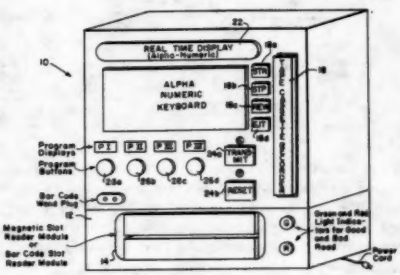
DATA TERMINAL SYSTEM

Jeffrey H. Zerowin, 3 Franciscan Way, Fairlawn, N.J. 07410

Filed Mar. 14, 1985, Ser. No. 711,952

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—380 **18 Claims**



1. An identification system comprising:

a plurality of identification cards available for use by a plurality of individuals;

multiple terminals, each of said terminals operating as a stand-alone entity independent of each of the other of said terminals;

a plurality of readable record means, each of said record means adapted to be coupled to any one of said terminals, each of said record means being readily removable from the terminal to which it is coupled and portable between terminals;

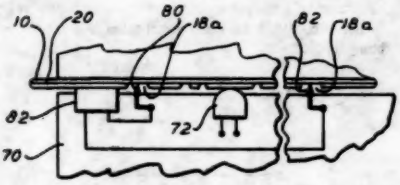
each of said terminals including means to read identification data from any one of said identification cards presented at the terminal involved, and means to record said identification data on the record means that is coupled to said terminal.

4,639,584

NON-ALTERABLE MAGNETIC CODING

Robert T. Adams, 64 Great Hills Rd., Short Hills, N.J. 07078, and Ronald Erickson, 1416 Morris Ave., Suite 3, Union, N.J. 07083

Filed Jul. 25, 1985, Ser. No. 758,695
Int. Cl.[4] G06K 7/08
U.S. Cl. 235—449 44 Claims



1. A card for carrying a machine readable magnetic code, comprising:

a non-magnetic substrate; and

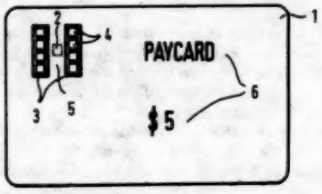
an interrupted strip of nonpermanently magnetizable material affixed to said substrate, said strip being several times thinner than said substrate, said strip having a column of parallel rifts, none of said substrate being in said rifts, said rifts and said magnetizable material between each of said rifts being arranged in a pattern bearing a predetermined relationship to said code, said magnetizable material between each of said rifts being magnetized in the same direction.

4,639,585

DATA CARRIER WITH AN IC MODULE AND A METHOD FOR PRODUCING SUCH A DATA CARRIER

Yahya Haghiri-Tehrani, and Joachim Hoppe, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Sep. 11, 1984, Ser. No. 649,378
Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3420051
Int. Cl.[4] G06K 15/00
U.S. Cl. 235—492 13 Claims



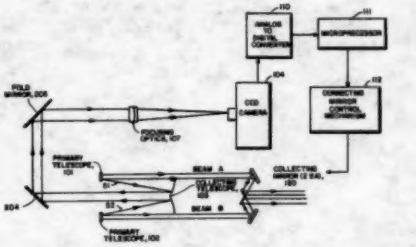
1. A data carrier with an IC module for processing electrical signals, in which the IC module is disposed in the interior of the data carrier and connected via leads to contact surfaces arranged in the vicinity of the IC module, communication taking place with peripheral units via these contact surfaces, characterized in that a first area of the data carrier in which the IC module, the leads and the contact surfaces are provided is connected with a second, remaining area of the data carrier by one or more predetermined breaking points arranged along a line separating the two areas and which reduce transmission of bending stresses from one area of the card to the other.

4,639,587

OPTICALLY PHASED LASER TRANSMITTER

Janet S. Fender, Albuquerque, N. Mex.; Salvatore J. Cusumano, Champaign, Ill.; Robert R. Butts, Colorado Springs, Colo., and Christopher R. DeHainaut, Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1985, Ser. No. 698,962
Int. Cl.[4] G01J 1/20; G01B 9/02
U.S. Cl. 250—201 17 Claims



1. A laser transmitter which produces an output by phase matching all outputs of an array of independent laser telescopes including a first primary telescope which has a first singular laser source which emits a first laser beam, and a plurality of second primary telescopes each placed in a position adjacent to said first primary telescope, each of said second primary telescopes having their own independent and singular laser source emitting their own independent second laser beams thereby creating a plurality of second laser beams, said laser transmitter comprising:

a plurality of collecting telescopes facing and bridging said first and second primary telescopes, each of said plurality of collecting telescopes intercepting and diverting a sample of said first laser beam from said first primary telescope and a sample of said second laser beams from one of said plurality of second primary telescopes by partially blocking the first and second laser beams, said plurality of collecting telescopes reflecting all intercepted beams back in sets of focus points, each of said focus points being a focused pair of said sample from said first primary telescope and a sample of said second laser beam which is obtained from the first and second primary telescopes which are bridged by that particular collecting telescope;

a detector array means receiving said sets of focus points from said plurality of said collecting telescopes and generating therefrom a set of interference patterns between each second laser beam from said plurality of second primary telescopes and the first laser beam from said first primary telescope;

an analog-to-digital converter receiving and converting into a set of digital signals said set of interference patterns from said detector array means;

a data processor means receiving said set of digital signals from said analog-to-digital converter and estimating an optical path length adjustment amount between each of said second laser beams and said first laser beam, said optical path adjustment amount being a measure of distance between the optical path lengths of said first laser beam and an associated second laser beam such that the application of said optical path length adjustment amount to the optical path of the second laser beam results in a matching of the phase of said second laser beam to said first laser beam; and

a correcting means receiving said optical path length adjustment amount from said data processor and receiving said first and second laser beams from said first and second primary telescopes, said correcting means performing an

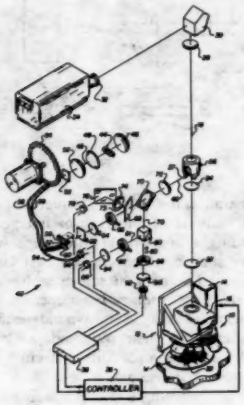
adjustment of the optical path length of each of said second laser beams to match their phases with said first laser beam.

4,639,587

AUTOMATIC FOCUSING SYSTEM FOR A MICROSCOPE

Curt H. Chadwick, Los Altos; Art M. Shulenberger, Capitola; John S. Taylor, San Jose, and Richard R. Simmons, Los Altos, all of Calif., assignors to KLA Instruments Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 582,584, Feb. 22, 1984. This application Jan. 22, 1985, Ser. No. 693,651
Int. Cl.[4] G01J 1/20
U.S. Cl. 250—201 20 Claims



1. An automatic focusing system for a microscopic optical inspection system of the type used to inspect objects such as semiconductor wafers and the like, and having an optical inspection axis extending between an inspection means and an electrically controllable microscope device, comprising:

means forming a first optical axis having a light source at one end and a first beamsplitter means at the other end, said first beamsplitter means being disposed along said optical inspection axis and operative to pass light from said first optical axis into said microscope device and to return reflected light from said microscope device back along said first optical axis;

means disposed along said first optical axis for cooperating with said light source to develop and for alternately communicating bursts of spacially separated light rays from opposite sides of said first optical axis to a pupil means disposed along said first optical axis at the conjugate image location of the back aperture of the microscope objective;

reticle means disposed along said first optical axis between said pupil means and said first beamsplitter means and having aperture means formed therein such that each said burst of light from said pupil passes through said reticle means and casts an image of the aperture means onto the object being inspected by said microscope device;

second beamsplitter means disposed between said reticle means and said first beamsplitter means and operative to deflect returning light from said object, including said aperture means images, onto a second optical axis defined at one end by said second beamsplitter means and at the other end by an S-CURVE photodetector means, and including a first return mask disposed along said second optical axis;

third beamsplitter means disposed along said second optical axis between said second beamsplitter means and said first return mask, said third beamsplitter means reflecting a portion of said returning light along a third optical axis having said third beamsplitter means at one end and a SUM photodetector means at the other end, and including a second return mask disposed therebetween; and

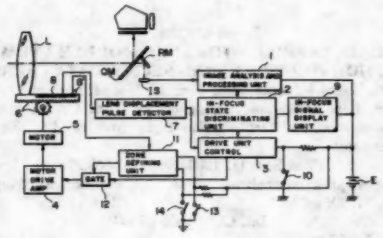
electronic control means responsive to the output signals developed by said SUM photodetector means and said S-CURVE photodetector means and operative to generate drive signals for controlling the positioning of said microscope device relative to the object being inspected such that said microscope device focuses to a level commensurate with the average local relief of the surface area being inspected.

4,639,588

AUTOMATIC FOCUSING DEVICE WITH RANGE BOUNDARY SETTING

Nobuhiko Shinoda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,270
Claims priority, application Japan, Sep. 5, 1983, 58-162802
Int. Cl.[4] G01J 1/20
U.S. Cl. 250—201 7 Claims



1. An automatic focusing device for an imaging lens, comprising:

(a) focus state detection means for producing a signal representing a focus adjusting state of the imaging lens;

(b) driving means for moving the imaging lens to an in-focus position on the basis of the adjusting state signal;

(c) memory means;

(d) signal forming means for producing a memory signal, said memory signal being used for causing said memory means to store first in-focus position information and second in-focus position information, the first in-focus information being obtained from an output of said focus state detection means which corresponds to the object-position of a predetermined object, and the second in-focus state position information being obtained from an output of said focus state detection means which corresponds to another object-postion different from the object-position of the predetermined object; and

(e) control means for permitting a lens moving operation of said driving means on the basis of the output of said focus state detection means, when the output is of a value between the outputs respectively corresponding to the first and second in-focus state position information.

4,639,589

OPTICAL SCANNING DEVICE, PARTICULARLY FOR SEEKER HEADS IN TARGET SEEKING MISSILES

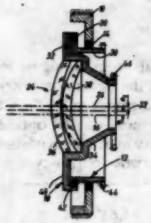
Berthold Weber, Bodman; Peter Giesenberg, Salem, and Johannes Steimel, Constance, all of Fed. Rep. of Germany, assignors to Bodenseewerk Gerätetechnik GmbH, Uberlingen, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,465

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1984, 3438898

Int. Cl.[4] G01J 1/20

U.S. Cl. 250—203 R 7 Claims



1. Optical scanning device, particularly for seeker heads in target seeking missiles, comprising

(a) a base portion (10),

(b) a detector (74) located on the base portion (10),

(c) a holder (18) rotatably mounted and driven about an axis or rotation (22), and

(d) an optical imaging system (72)

(d_1) adapted to image a field of view in the plane of the detector (74), and

(d_2) comprising imaging optical means (24) presenting rotation symmetry, which are arranged on the holder (18) and define an optical axis (26), which extends eccentrically with regard to the axis of rotation (22) of the holder (18),

characterized in that

(e) the hodler (18) is mounted in a bearing portion (12) rotatably mounted and driven about an axis of rotation (16) with regard to the base portion (10), and

(f) the axis of rotation (22) of the holder (18) extends eccentrically with regard to the axis of rotation (16) of said bearing portion (12).

4,639,590

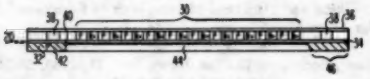
INTENSIFIED CHARGE-COUPLED IMAGE SENSOR HAVING A CHARGE-COUPLED DEVICE WITH CONTACT PADS ON AN ANNULAR RIM THEREOF

Gilbert N. Butterwick, Upper Leacock Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 26, 1985, Ser. No. 705,707

Int. Cl.[4] H01J 31/50

U.S. Cl. 250—213 VT 2 Claims



1. In an intensified charge-coupled image sensor of the type comprising

an image intensifier section including an envelope having therein a photoemissive cathode for emitting photoelectrons in a pattern corresponding to the intensity of radiation incident thereon, and

a header assembly spaced from said cathode, said header assembly including a charge-coupled device with a front surface having a plurality of electrodes adjacent thereto and a back surface directed toward said cathode for receiving photoelectrons therefrom,

wherein the improvement comprising

said charge-coupled device being formed on a disc-shaped semiconductor wafer having a center portion and an annular rim portion, said center portion having a thickness less than that of said annular rim portion, said rim portion having a plurality of contact pads around at least a portion thereof which are electrically connected to different ones of said plurality of electrodes.

4,639,591

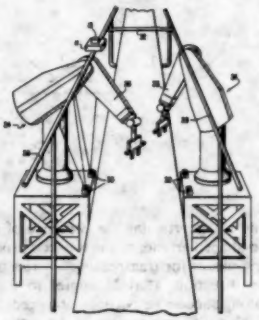
SYSTEM FOR OPTICAL MONITORING OF MACHINE POSITIONS

Robert F. Barry, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1984, Ser. No. 688,117

Int. Cl.[4] G01V 9/04

U.S. Cl. 250—221 7 Claims



1. In an installation includir g a plurality of machines disposed adjacent a common work space delimited by a boundary surface, each machine being associated with a respective portion of the boundary surface and having a work-performing member selectively movable into and out of the work space through the associated boundary surface portion to perform an operation in the work space, the improvement comprising an optical monitoring system composed of a plurality of optical monitoring assemblies each associated with a respective machine, each said assembly comprising:

light barrier means including means producing a plurality of light beams and an associated plurality of light sensors each disposed in the path of a respective light beam, said light barrier means forming a light barrier coextensive with the boundary surface portion associated with the associated machine, and each said light sensor producing an electrical signal indicative of reception of its associated light beam;

electrical signal processing means connected to all of said light sensors to receive the electrical signals therefrom for producing a light barrier intrusion signal when any one of said light sensors is not receiving its associated light beam;

optical warning means connected to said electrical signal processing means for emitting a predetermined light signal in response to production of a light barrier intrusion signal;

light receiving means optically linked with said optical warning means of every other assembly for producing a warning signal in response to emission of the predetermined signal by said optical warning means of any other assembly; and

control means connected between said light receiving means and the associated machine for causing the work-performing member of the associated machine to remain outside

the work space when a warning signal is being produced by said light receiving means.

4,639,592

CIGARETTE TESTING APPARATUS

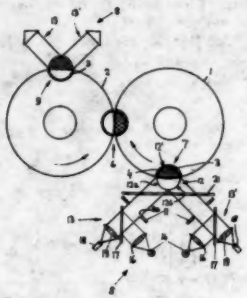
Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. Kg., Hamburg, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,578

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321408

Int. Cl.⁴ G01N *21/88*

U.S. Cl. 250—223 B **24 Claims**



1. Apparatus for ascertaining the presence of defects at the exterior of rod-shaped articles of the tobacco processing industry, comprising means for transporting a series of articles in a predetermined direction, at right angles to the axes of the articles, and along successive portions of a predetermined path in each of which a different section of the exterior of the articles is exposed, said transporting means comprising several neighboring conveyors with a transfer zone between neighboring conveyors, said conveyors including first and second conveyors and said portions of said path including first and second portions which are defined by the respective conveyors, the number of transfer zones in said transporting means between said first and second conveyors being an odd number and said conveyors including means for holding the articles against movement with reference to the respective conveyors during transport along the respective portions of said path; and discrete scanning means for each portion of said path, each of said scanning means comprising means for monitoring the respective section of the exterior of the article in the corresponding portion of said path and for generating signals in response to detection of defects.

4,639,593

AIRFLOW DETECTION SYSTEM USING FIBER OPTICS

Karl A. Stetson, Coventry, Conn., and John Palecki, Northampton, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 29, 1984, Ser. No. 665,845

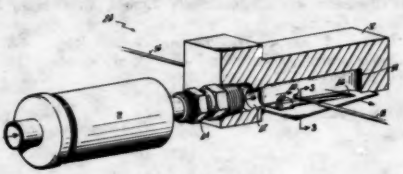
Int. Cl.⁴ H01J *5/14*; G01D *5/30*; G01L *11/00*; G01F *1/66*

U.S. Cl. 250—227 **8 Claims**

1. A sensor, for providing an optical signal indicative of the presence of fluid flow in a plenum, in a system having an optical signal detector and optical signal source, comprising:

displacement means, having a chamber for receiving fluid flow from the plenum and including a cantilevered member disposed therein, said cantilevered member oscillating at a sensor characteristic frequency in response to fluid flow through said chamber; and

first and second optical sections having an optical surface on each end thereof, said sections arranged end to end on a major surface of said cantilevered member such that a first end of each form, in combination, an optical coupling, said coupling adapted to flex with oscillation of said cantilevered member, the opposite end of said first and second sections being optically aligned with the optical signal source and the optical signal detector, respectively, to



couple optical signals from the signal source through said optical coupling to the dectector, whereby oscillation of said member in the presence of fluid flow produces an oscillatory misalignment of said optical coupling to further provide intensity modulation of such optical signals at the sensor characteristic frequency.

4,639,594

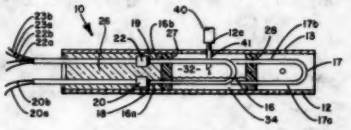
FIBEROPTIC PROBE AND METHOD OF MAKING AND USING

Stephen A. Schoch, Clay, and Howard W. Sibley, Baldwinsville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1984, Ser. No. 682,504

Int. Cl.⁴ H01J *5/16*

U.S. Cl. 250—227 **10 Claims**



1. A fiberoptic probe for in situ sensing of a fluid condition by immersion therein comprising:

a tubular sheath;

a reference fluid sealed within a first chamber in said sheath;

a first U-shaped fiber within said first chamber so as to be isolated from the fluid to be sensed;

a second U-shaped fiber extending through said first chamber so as to contact the fluid to be sensed;

an LED positioned in said sheath so as to direct light into said first and second U-shaped fibers;

a first detector means in said sheath for detecting light passing through said first U-shaped fiber; and

a second detector means in said sheath for detecting light passing through said second U-shaped fiber.

4,639,595

OPTICAL ROTARY ENCODER

Masao Okita, and Hiroyasu Miyata, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Feb. 21, 1984, Ser. No. 581,661

Claims priority, application Japan, Feb. 21, 1983, 58-26375

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—231 SE **7 Claims**

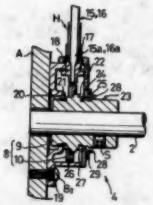
1. In an optical rotary encoder for providing rotation signals indicative of rotation of an associated device, said encoder comprising an encoder shaft (2), a shaft fitting member (9) mounted on said encoder shaft, a rotor disk (10) fixed to said shaft fitting member and having at least one light reflecting element on its circumference, a housing (4) for said rotor disk, and an optical detection head (H), having a light emitting part (15*a*) and a light receiving part (16*a*), which is mounted in said

housing at an axial position corresponding to an operative position of said rotor disk wherein light from said light emitting part can be reflected by said light reflecting element on the circumference of said rotor disk and received by said light receiving part for detection of rotation of said rotor disk,

the improvement of said encoder further comprising:

said shaft fitting member (9) and said rotor disk (10) being axially movable on said encoder shaft (10) from an assembly position to the operative position, said shaft fitting member having formed on one end thereof a first positioning engaging part (20) axially spaced apart from a first relief part (21);

means for locking said shaft fitting member (9) on said encoder shaft (2) at said operative position;



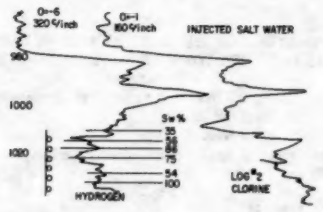
said housing (4) including a holding member (19) having a positioning engaged part (26) which engages said first positioning engaging part (20) of said shaft fitting member (9) to hold said rotor disk (10) fixed relative to said housing in said assembly position during assembly, said shaft fitting member and rotor disk being movable axially in said housing to said operative position and locked by said locking means to said shaft at said operative position upon completion of assembly, wherein said first positioning engaged part (26) of said holding member (9) is disposed opposite and without contacting said first relief part (21) of said shaft fitting member such that said rotor disk is rendered rotatable relative to said housing.

4,639,596

PETROLEUM RESERVOIR FLOODING METHOD

Harley L. Tanner, III, Houston, and Joseph C. Allen, Bellaire, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 6, 1983, Ser. No. 456,065
Int. Cl.[4] G01T 1/18
U.S. Cl. 250—259 **7 Claims**



1. A method of flooding a petroleum reservoir in an earth formation by way of an injection well to aid in the recovery of hydrocarbons from a recovery well comprising:

running a radioactive well logging tool in the injection well to derive a first well log of the reservoir in the vicinity of the injection well,

flooding the reservoir with a solvent fluid injected in the reservoir at a predetermined rate from the injection well to displace the hydrocarbons present in the reservoir,

running the well logging tool in the injection well so as to derive a second well log,

injecting substantially high salinity salt water into the reservoir,

running the well logging tool in the injection well so as to derive a third well log, and

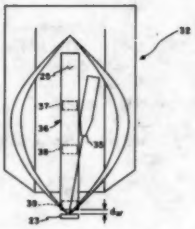
utilizing the well logs to provide a record of the effectiveness of the solvent flood.

4,639,597

AUGER ELECTRON SPECTROMETER CAPABLE OF ATTAINING A HIGH RESOLUTION

Yoshiro Shiokawa, Tokyo, Japan, assignor to Anelva Corporation, Japan

Filed Oct. 23, 1984, Ser. No. 663,855
Claims priority, application Japan, Oct. 24, 1983, 58-197546
Int. Cl.[4] H01J 37/252
U.S. Cl. 250—305 **11 Claims**



1. In an Auger electron spectrometer comprising an electron gun for radiating an electron beam onto a surface of an object to make the surface emit Auger electrons and an electron spectroscope for detecting and analyzing said Auger electrons, said electron gun having an electron gun axis extended to said surface, an electron beam source for generating said electron beam along said electron gun axis, and an electron lens system between said electron beam source and said surface for guiding said electron beam towards said surface along said electron gun axis, the improvement wherein said electron lens system comprises:

controllable electrostatic lens means adjacent to said electron beam source for controllably focusing said electron beam into a controllably processed beam; and

a permanent magnet member nearer to said surface than said electrostatic lens means for generating a magnetic field to focus said processed beam onto said surface.

4,639,598

FIRE SENSOR CROSS-CORRELATOR CIRCUIT AND METHOD

Mark T. Kern, Goleta, and Kenneth A. Shamordola, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed May 17, 1985, Ser. No. 735,039
Int. Cl.[4] G08B 17/12
U.S. Cl. 250—339 **36 Claims**

1. A cross-correlation circuit for fire sensing comprising:

first and second parallel signal channels for responding to long wavelength and short wavelength radiation, respectively;

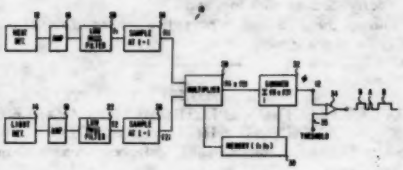
said first channel including a short wavelength detector, an amplifier, a low pass filter, and signal sampling means coupled together in series;

said second signal channel including a long wavelength detector, an amplifier, a low pass filter and signal sampling means coupled together in series;

a signal multiplier stage coupled to receive the sampled

signal outputs of the two signal channels and multiply sampled signals together by pairs; and

means coupled to the output of said multiplier stage for summing the sampled pair products in order to develop a



cross-correlation function signal corresponding to said signals from said signal channels which is indicative of the detection by both of said detectors of radiation from a fire source.

4,639,599

RING TYPE SINGLE-PHOTON EMISSION CT IMAGING APPARATUS

Takashi Ichihara, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

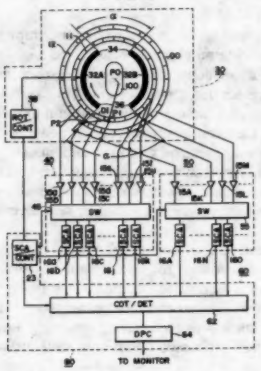
Filed May 9, 1985, Ser. No. 732,078

Claims priority, application Japan, May 10, 1984, 59-94797; May 10, 1984, 59-94798

Int. Cl.[4] G01T 1/164

U.S. Cl. 250—363 S 20 Claims

FIG. 5



1. A single-photon emission computerized tomography imaging apparatus comprising:

first ring-shaped means including thereon a plurality of first detector elements and surrounding an object under examination to which radioisotope has been administered;

second ring-shaped means including thereon a plurality of second detector elements and concentrically surrounding the first ring-shaped means, wherein a gamma ray irradiated from the administered radioisotope through the object firstly scatters in one of the first detector elements, producing a first detector signal and thereafter the scattered gamma ray disappears in one of the second detector elements, producing a second detector signal;

first analyzing means including a plurality of first single channel analyzers coupled to the corresponding first detector elements for analyzing whether an energy level of the first detector signal is involved in a first predetermined level width of the first single channel analyzers and producing a first analyzing signal;

second analyzing means including a plurality of second single channel analyzers coupled to the corresponding second detector elements for analyzing whether an energy level of the second detector signal is involved in a second predetermined level width of the second single channel analyzers and producing a second analyzing signal;

image reconstruction means for reconstructing a computerized tomographic image signal by processing the first and second analyzing signals, said first and second analyzing signals containing both first data on the positional information of the first and second detector elements upon which said gamma ray and scattered gamma ray are incident, and second data on the energy information derived from the first and second analyzing means; and

means for displaying a computerized tomographic image by receiving the reconstructed tomographic image signal.

4,639,600

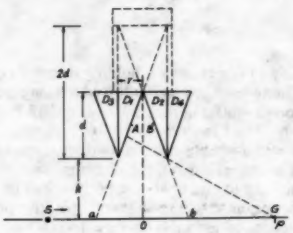
RADIATION DETECTOR

Gerard R. Laurer, Monroe, N.Y., assignor to New York University, New York, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,373

Int. Cl.[4] G01T 1/20

U.S. Cl. 250—363 S 15 Claims



7. In a radiation detector assembly wherein a radiation source is adapted to be scanning by at least one radiation detector element, the detector element having a surface for receiving radiation from said source, the improvement wherein at least a portion of said surface is at an acute angle to the direction of relative scanning between said element and source, whereby said portion is blocked from receiving radiation from said source in predetermined regions, said surface being positioned to receive uncollimated radiation from said source, said radiation detector having at least four of said radiation detector elements adjoining one another with the radiation receiving surfaces thereof defining a pyramidal recess in said detector.

4,639,601

APPARATUS FOR DETECTING AND DETERMINING THE DISTRIBUTION OF RADIOACTIVITY ON A MEDIUM

Brian R. Pullan, 167 Bramhall Lane South, Bramhall, Stockport, SK7 2NG, England

Filed Nov. 23, 1983, Ser. No. 574,328

Claims priority, application United Kingdom, Nov. 25, 1982, 8233701

Int. Cl.[4] G01T 1/185

U.S. Cl. 250—385 10 Claims

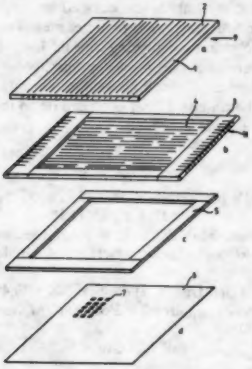
1. Apparatus for providing output signals relating to individual ionizing events due to radioactive decay of material in a sample medium on a planar support, said apparatus comprising:

A an ionization chamber;

B a scanning head disposed in said ionization chamber and including two detecting electrode assemblies which are located in spaced apart relationship, each detecting electrode assembly having an array of spaced conductors, the conductors on one array extending transversely of the conductors of the other array thereby providing a plural-

ity of conductor crossing points; and a mask having a plurality of radiation transmissive zones therein, said mask being supported relative to said detecting electrode assemblies such that said radiation transmissive zones respectively correspond with said conductor crossing points;

C means supporting said scanning head in juxtaposition with a sample receiving zone for receiving said sample medium so that when the sample medium is in place, the mask is then in close proximity to its planar support; and



D scanning means to cause relative movement between said scanning head and said sample receiving zone so that said radiation transmissive zones in said mask scan a predetermined path relative to said sample receiving zone, whereby said radiation transmissive zones expose said corresponding crossing points to respective scanning regions of said sample receiving zone and said electrode assemblies yield said output signals.

4,639,602

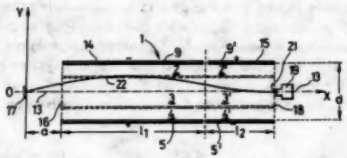
SYSTEM FOR DEFLECTING A BEAM OF CHARGED PARTICLES

Martin Henzler, Garbsen, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,046

Claims priority, application European Pat. Off., Feb. 18, 1984, 84101691

Int. Cl.[4] G21K *1/08*; H01J *3/14*

U.S. Cl. 250—396 R **4 Claims**

1. A deflection system for a beam of charged particles, having a plurality of concentrically arranged deflection plates surrounding the beam, comprising:

a rotationally symmetrical arrangement of eight plates with respect to the axis of the system, the deflection plates being divided in their longitudinal direction into a plurality of longitudinally divided sections, and a voltage supply for the plates, and the ratio of deflection plate section lengths, and the voltage supply for the plates, being selected such that the beam leaves the system parallel to its axis.

4,639,603

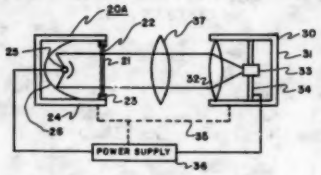
IR IMAGE SOURCE USING SPECULARY REFLECTIVE TRANSPARENCY

Helmut H. Pistor, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1985, Ser. No. 747,207

Int. Cl.[4] G01M *11/00*; G03B *21/00*

U.S. Cl. 250—504 R **8 Claims**



1. A FIR image projector comprising:

a source of FIR radiation;

a transparency in the path of said radiation, said transparency having;

a base layer,

an image receiving layer on said base layer containing an image of specularly reflective silver,

and a layer of transparent abrasion resistant material over said emulsion layer.

4,639,604

METHOD AND APPARATUS FOR DETECTING AN EDGE POSITION OF A PATTERN AND ELIMINATING OVERLAPPING PATTERN SIGNALS

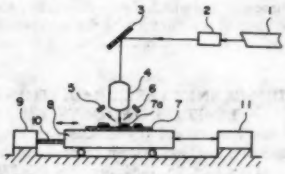
Seiro Murakami, Tokyo, and Muneki Hamajima, Kawasaki, all of Japan, assignors to Nippon Kagaku K.K., Tokyo, Japan

Continuation of Ser. No. 593,870, Mar. 27, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 851,293

Claims priority, application Japan, Mar. 29, 1983, 58-51504; Apr. 7, 1983, 58-60081

Int. Cl.[4] G01N *21/86*; G01V *9/04*

U.S. Cl. 250—548 **17 Claims**



8. An apparatus for detecting a position of a pattern of a predetermined shape on an object emitting a radiation indicative of the pattern through reception of the radiation, said apparatus comprising:

(a) means adapted to scan said object in a predetermined direction with respect to said object to detect the radiation from said object, said means successively generating a pattern signal corresponding to said pattern in response to said scanning in accordance with said detected radiation;

(b) position detecting means for detecting a position of the scanning of said radiation detecting means along said predetermined direction and generating a position signal each time the position of said scanning advances a predetermined unit amount; and

(c) means for sampling a value of said pattern signal in response to each of said position signals, said sampling means eliminating each overlapping value of said pattern

signal sampled at the same scanning position as any one of the values of said pattern signal.

4,639,605

FIRE SENSOR DEVICE

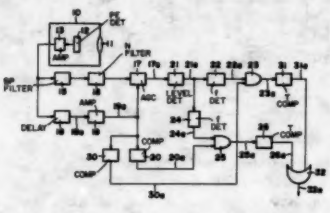
Hiroshi Seki, 2265 Kamihongo, Matsudo-shi, Chiba-ken, and Ryuichiro Kataishi, Kyoto, both of Japan, assignors to Hiroshi Seki, Chiba, Japan

Filed Apr. 17, 1984, Ser. No. 601,176

Claims priority, application Japan, Apr. 20, 1983, 58-69752

Int. Cl.⁴ G08B *17/12*

U.S. Cl. 250—554 **9 Claims**



1. A fire sensor device for detecting the movement of flames and the presence of smoke comprising:

(1) a detector unit having a condenser lens adapted to determine variations of brightness based upon variations in the illumination of said detector unit which occur due to said movement of flames of a fire and said presence of smoke proximate said detector unit and for producing a detector signal,

(2) correction circuit means, connected to said detector unit, for compensating errors in said detector signal due to slowly changing variations in the illumination of said detector unit,

(3) a first frequency detection circuit, connected to said correction circuit means and receiving the compensated detector signal, for detecting flame,

(4) a second frequency detection circuit, connected to said correction circuit means and receiving the compensated detector signal, for detecting smoke,

wherein the frequency and amplitude of said detector signal output from said detector unit and the number of pulses generated, based upon said detector signal, during a predetermined period of time are computed, thereby detecting the presence of fire on the basis of the duration of the computed signal.

4,639,606

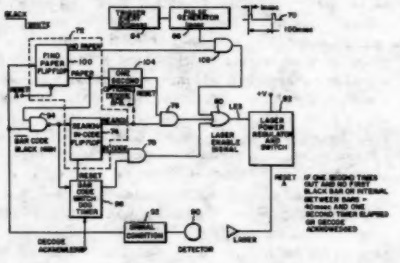
BAR CODE SCANNER LASER RADIATION EXPOSURE LIMIT CONTROL SYSTEM

John A. Boles, Fishers, and Jay M. Eastman, Pittsford, both of N.Y., assignors to Optel System Limited, Rochester, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,276

Int. Cl.⁴ G06K *7/10*

U.S. Cl. 250—555 **9 Claims**



1. In a code symbol scanner apparatus having a laser normally operable at a power output above radiation safety limits and photodetector means for deriving signals from said code symbols, the improvement which comprises mode control means for providing a first mode of operation of said apparatus during which a search is carried out for said code symbols and a second mode of operation after said symbols are detected and while scanning of said symbols is carried out, means for operating said mode control means for initiating said second mode upon detection of a first of said symbols, means for discontinuing said second mode unless signals corresponding to successive ones of said symbols are derived by said photodetector means within a given period of time, means operated by said mode control means for turning on said laser during said first and second modes at said power output above said limits, and means for further controlling said mode control means for controlling the time said laser is turned on so that the radiation safety limits are not exceeded.

4,639,607

DEVICE FOR SENSING A RECORDING MEDIUM IN A LINE PRINTER

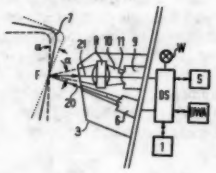
Alois Brandner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,498

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345030

Int. Cl.⁴ G01N *9/04*

U.S. Cl. 250—561 **11 Claims**



1. In a sensing device of a printing apparatus having a printing head movable line-wise along a recording medium which is conducted over a reflective surface, said sensing device having sensing means coupled to move with the printing head for determining the presence of a recording medium in front of the reflective surface, said sensing means including a radiation source for projecting radiation at a spot on the reflective surface and photoelectric receiving means having a receiving surface for receiving a sensing beam reflected from a spot of the reflective surface, the improvements comprising said sensing means including a convergent lens system being disposed in front of the receiving means with one of the focal points of the lens system being positioned in the immediate proximity of said spot on the reflective surface so that the lens system planarly projects the sensing beam onto the receiving surface even when the beam is deflected from a desired path of reflection.

4,639,608

IMAGE READ-OUT APPARATUS WITH LIGHT SOURCE DRIVING MEANS

Yasuo Kuroda, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,197

Claims priority, application Japan, May 18, 1983, 58-85891; Jun. 1, 1983, 58-95680

Int. Cl.⁴ H01J *40/14*; H04N *1/10*

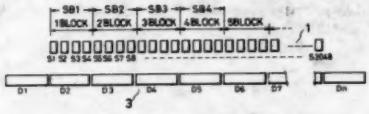
U.S. Cl. 250—578 **14 Claims**

1. An image read-out apparatus comprising:

light source means for exposing an original document, said light source means comprising a plurality of light source

blocks which are arranged for exposign a line of image, each said light source block being able to be turned on individually;

image sensor means for reading an image of the original document based on light from the original document exposed by means of said light source means; and



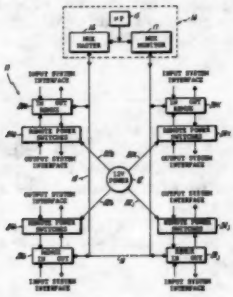
driving means for driving said light source means so as to turn on said light source blocks sequentially, said driving means being operable to cause adjacent light source blocks to be turned on during a predetermined time period on an overlap basis.

4,639,609

LOAD CURRENT MANAGEMENT SYSTEM FOR AUTOMOTIVE VEHICLES

William M. Floyd, Livonia, and David L. Juzswik, Dearborn Heights, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Feb. 26, 1985, Ser. No. 705,480
Int. Cl.[4] B62G 45/00
U.S. Cl. 307—10 R **19 Claims**



1. An electrical power delivery system for a vehicle comprising:

power conducting means for delivering power to a plurality of loads in a region of said vehicle, said power conducting means having a fixed capacity to carry current which capacity is less than the current required to simultaneously operate all of said loads;

power switch means connecting the power conducting means to each of said loads, said power switch means including control means for selectively energizing the appropriate loads in response to selected input signals; and

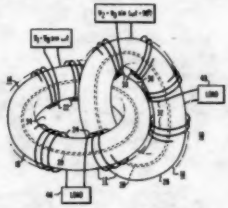
logic means operatively connected to the control means to circumvent the input signals to selectively energize the power switch means to prevent the current flow through the power conducting means from exceeding the capacity of the power conducting means.

4,639,610

ROTATING FLUX TRANSFORMER

Robert M. Del Vecchio, Sunnyvale, Calif., and Theodore R. Specht, Sharon, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1985, Ser. No. 807,147
Int. Cl.[4] H02J 1/00; H01H 85/02
U.S. Cl. 307—83 **17 Claims**



1. An electrical transformer, comprising:

first and second magnetic cores,

each of said first and second magnetic cores being a closed loop which defines a core window, with each magnetic core having an outer surface surrounding a longitudinal axis and a continuous axially extending opening,

first and second shorted poloidal windings disposed in the axially extending openings of said first and second magnetic cores, respectively,

first and second toroidal primary windings disposed about the outer surfaces of said first and second magnetic cores, respectively,

first and second sources of alternating potential connected to said first and second toroidal primary windings, respectively, with said first and second sources of alterating potential having like frequencies which are phase displaced by about 90 electrical degrees,

and a first toroidal secondary winding disposed in inductive relation with a selected one of said first and second toroidal primary windings,

said first and second magnetic cores being linked, with each magnetic core passing through the window of the other magnetic core, to induce a voltage in each of said first and second shorted poloidal windings which is 90° out of phase with the voltages applied to the first and second toroidal primary windings, respectively,

wherein the magnetic fluxes in each magnetic core due to the toroidal primary winding and shorted poloidal winding produce a rotating induction vector.

4,639,611

BRIDGE CIRCUIT SYSTEM

Charles K. Sticher, Snellville, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Jan. 9, 1985, Ser. No. 689,829
Int. Cl.[4] G05D 23/24; H05B 1/02
U.S. Cl. 307—117 **6 Claims**

1. A bridge circuit system comprising:

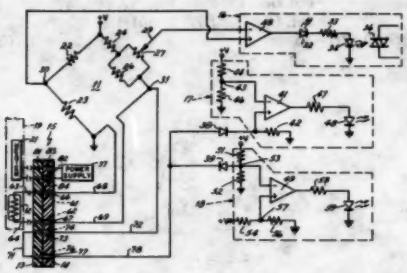
a bridge circuit including a variable impedance element which can be selectively connected and disconnected to the bridge circuit;

means for sensing impedance variations in the variable impedance element when it is connected to the bridge circuit;

fault detection means, which can be selectively connected and disconnected to the bridge circuit, for detecting impedance fault conditions of the variable impedance element when both said fault detection means and said variable impedance element are connected to said bridge; and

electrical connector means, including a first connector component connected to the variable impedance element and a second connector component connected to the bridge

circuit, for connecting the variable impedance element to the bridge circuit when the first and second connector components are connected together, and for connecting



the fault detection means to the bridge circuit only when the first and second connector components are connected together.

4,639,612

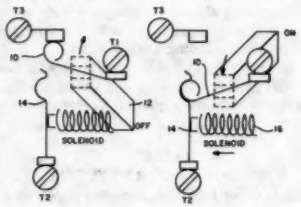
ELECTRO MECHANICAL SWITCH HAVING REMOTELY CONTROLLED OFF POSITION

Gordon Bowman-Jones, Foster City, Calif., assignor to Endless Energy, Inc., Paramus, N.J.

Filed May 3, 1985, Ser. No. 729,924

Int. Cl.[4] H01H *1/52*

U.S. Cl. 307—132 E **6 Claims**



1. An electromechanical switch comprising

a power terminal for receiving electrical power,

a first switch terminal,

a second switch terminal,

a first spring contact coupled to said power terminal and spring biased towards said first switch terminal,

a second spring contact coupled to said second switch terminal and configured to receive said first spring contact in yieldable engagement,

a lever coupled to said first spring contact for manually moving said first spring contact to engagement with said second spring contact, and

solenoid means actuable in response to removal of power from said switch for releasing the yieldable engagement of said first and second spring contacts.

4,639,613

BROAD BAND COUPLING SWITCH ARRANGEMENT WITH GATED POWER SUPPLY

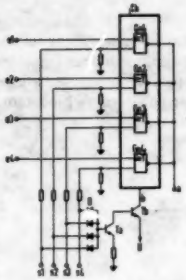
Helmut Bauch, Starnberg, and Hans Rehm, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 173,658, Jul. 29, 1985, abandoned. This application Nov. 29, 1985, Ser. No. 802,625

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932588

Int. Cl.[4] H03K *17/56, 19/086, 3/01*

U.S. Cl. 307—241 **8 Claims**



1. A broad band coupling arrangement comprising a broad band switching network with coupling point switches, said network having a chip module providing logic elements in ECL technology for forming a plurality of said coupling point switches, and operating voltage supply means for said logic elements of said chip module, a switching transistor is inserted in said operating voltage supply means of each said chip module, said operating voltage supply means comprising a common operating voltage supply for said chip module shared by all of said logic elements of said chip module, and said swithing transistor being conductive for enabling said switching network only in response to a logic signal condition for at least one of said logic elements of the said chip module, said switching network using less energy when it is disabled than when it is enabled.

4,639,614

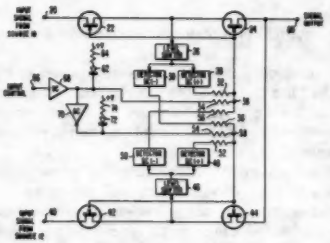
SOLID STATE RF SWITCH WITH SELF-LATCHING CAPABILITY

Philip C. Basile, Turnersville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 13, 1985, Ser. No. 775,606

Int. Cl.[4] H03K *17/56, 17/687*

U.S. Cl. 307—243 **19 Claims**



1. An apparatus for selectively enabling an input ac signal to a utilization means, said apparatus including means for providing a bias voltage and an input control signal, said apparatus comprising:

a switching device having input, output and control terminals, said device being responsive to an enabling voltage level at said control terminal for enabling signal flow between said input and said output terminals, and responsive to an inhibiting voltage level at said control terminal for inhibiting signal flow between said input and said output terminals;

first coupling means for coupling said input ac signal to said switching device input terminal;

second coupling means for coupling said utilization means to said switching device output terminal;

means responsive to said bias voltage and said input control signal for providing a switch control signal, said switch control signal having an enabling voltage level in response to a first voltage level of said input control signal, and having an inhibiting voltage level in response to a second voltage level of said input control signal;

means for detecting the ac signal enabled through said switching device and for providing therefrom a dc signal having said enabling voltage level; and

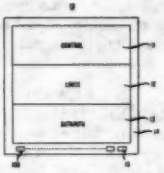
means for summing said switch control signal and said dc signal, and for applying the summed control signal to said control terminal of said switching device, whereby said switching device is actuated in accordance with said input control signal during the presence of said bias voltage, and is actuated in accordance with the detected level of the ac signal enabled through said switching device in the absence of said bias voltage.

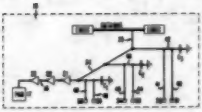
4,639,615

TRIMMABLE LOADING ELEMENTS TO CONTROL CLOCK SKEW

Charles M. Lee, New Providence, and Bernard T. Murphy, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 28, 1983, Ser. No. 566,154
Int. Cl.[4] H03K *19/096, 19/003, 5/13, 5/26*
U.S. Cl. 307—269 **12 Claims**





1. A semiconductor integrated circuit comprising:

clock means for generating clock pulses;

first and second logic circuits each having an output node and controlled by said clock means;

means for coupling clock pulses from said clock means to a first node connected to said first logic circuit;

and means for coupling clock pulses from said clock means to a second node connected to said second logic circuit,

characterized in that

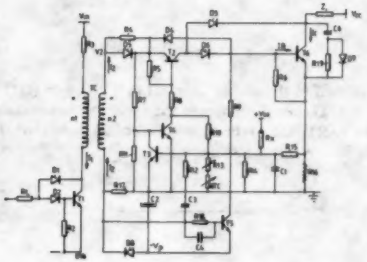
said integrated circuit further comprises at least one trimmable element connected to said first node and adapted to adjusting the skew of the clock pulses developed at said first logic circuit output node with respect to the clock pulses at said second logic circuit output node.

4,639,616

CIRCUIT FOR CONTROLLING THE BASE OF A POWER TRANSISTOR USED IN HIGH TENSION SWITCHING

Maurice Gaude, La Tronche, France, assignor to La Telemecanique Electrique, France

Filed Dec. 14, 1983, Ser. No. 561,256
Claims priority, application France, Dec. 14, 1982, 82 20906
Int. Cl.[4] H03K *3/45, 17/60*
U.S. Cl. 307—270 **10 Claims**



1. A base drive and control circuit for a bipolar power transistor having a base, a collector and an emitter through the collector emitter path of which a current flows when a turn on biasing voltage is applied to the base, whereas the power transistor is cut off when a turn off voltage is applied to the base, said control circuit comprising:

i—a pulse transformer having primary and secondary windings;

ii—source means for applying control pulses of one polarity across the primary winding;

iii—first switch means connecting the secondary winding to the base of said power transistor, said first switch means having a control input;

iv—first control means, connected to the control input of said first switch means and to the secondary winding, for closing said first switch means during the interval of each control pulse;

v—a capacitor;

vi—first circuit means connected to the secondary winding and to said capacitor for charging said capacitor to said turn off voltage;

vii—second switch means connecting said capacitor to the base of said power transistor, said second switch means having a control input, and

viii—second control means, connected to the secondary winding and to the control input of said second switch means, for closing the second switch means and discharging the capacitor during the interval between each control pulse and the next control pulse.

4,639,617

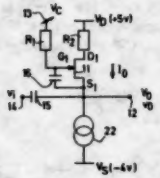
VARIABLE-BIAS CIRCUIT WITH HF TRANSMISSION PATH

Alex Giakoumis, Drancy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,406
Claims priority, application France, Jun. 29, 1984, 84 10368
Int. Cl.[4] H03K *3/01, 3/353*
U.S. Cl. 307—296 R **4 Claims**

1. A variable-bias circuit with an HF transmission path, having an output terminal (12) on which a variable bias voltage (Vo) is produced in response to variations of a d.c. control voltage (Vc) applied to a control terminal (13), which variable-bias circuit transmits an HF signal from an input terminal (14) to the output terminal (12) with a low attenuation, said input terminal and output terminal being interconnected by a decou-

pling capacitor (15), characterized in that said variable-bias circuit comprises a first field-effect transistor (11) whose source (S1) is driven by a constant-current generator (22) and



is connected to the output terminal (12), the gate (G1) of the transistor (11) being connected to the control terminal (13) via a resistor (R1) and to the source (S1) of the transistor (11) via a capacitive element (16).

4,639,618

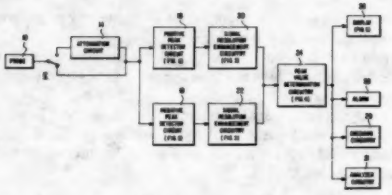
SPIKE DETECTOR CIRCUITRY

Ole V. Olesen, Annapolis, Md., assignor to Pace, Incorporated, Laurel, Md.

Filed Sep. 26, 1983, Ser. No. 535,925

Int. Cl.[4] H03K *5/19*; G01R *19/04*

U.S. Cl. 307—351 11 Claims



1. Circuitry for detecting a pulse of short duration including storage means for storing the peak amplitude of said pulse;

signal resolution enhancement means responsive to said storage means for establishing a plurality of channels respectively corresponding to a plurality of signal amplitude ranges where the range of signal amplitudes for each successive range is larger than that of the range preceding it, said signal resolution means including signal amplification means for each range;

peak signal detecting means responsive to said signal resolution enhancement means for (a) scanning said channels, (b) selecting one of said channels, said selected channel being such that said peak amplitude falls within the range for said channel, and (c) detecting said peak amplitude of the pulse;

said storage means including first storage means for storing the peak amplitude of positive going pulses and second storage means for storing the peak amplitude of negative going pulses; said signal resolution enhancement means including a first plurality of said channels for said positive going pulses and a second plurality of said channels for said negative going pulses; and

said peak signal detecting means including means for toggling between one channel corresponding to the smallest signal amplitude range for said positive going pulses and another channel corresponding to the smallest signal amplitude range for said negative going pulses.

4,639,619

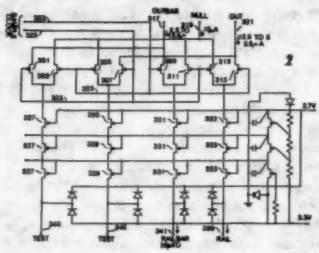
ELECTRONIC SAMPLER SWITCH

Gary Baldwin, Palo Alto, Calif.; Robert B. Hallgren, Ithica, N.Y.; Thomas Hornak, Portola Valley, Calif., and Fred H. Ives, Verndale, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 20, 1985, Ser. No. 799,887

Int. Cl.[4] H03K *17/14, 17/16, 17/687*

U.S. Cl. 307—352 8 Claims



1. An electronic sampler switch comprising:

a first switch having a switch input, a control input and a switch output, said first switch responsive to a control signal applied to the control input for coupling an input current applied at the switch input to the switch output when said control signal is of a first value and for coupling said input current away from the switch output when said control signal is of a second value; and

a second switch coupled to the switch output, said second switch responsive to said control signal for subtracting from the switch output a current sufficient to canel any current coupled to the switch output by said control signal from effects of interelectrode capacitance between the first switch control input and the switch output such that the total current at the switch output is equal to said input current when said control signal is of said first value and is zero when said control signal is of said second value.

4,639,620

PARALLEL-SERIES CONVERTER

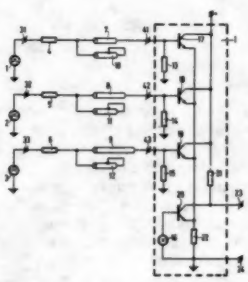
Johannes Wagenmakers, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1985, Ser. No. 690,924

Claims priority, application Netherlands, Jan. 11, 1984, 8400090

Int. Cl.[4] H03K *19/08*

U.S. Cl. 307—446 8 Claims



1. In a parallel-series converter having a plurality of parallel data signal inputs, a series data signal output, and a combining arrangement having a plurality of inputs equal in number to

said plurality of data signal inputs, the improvement characterized in that:

each of the parallel data signal inputs is respectively connected by a series arrangement of a terminating impedance and a transmission line to respective ones of the inputs of said combining arrangement, the time delays of the respective transmission lines having different magnitudes according to an arithmetical progression; and

the junction between each terminating impedance and the associated transmission line is connected to a short-circuited transmission line having a length $\lambda/2$, where λ is the wavelength of the data signal output of said converter;

whereby each pulse in an input data signal reaching any such junction is reflected back to such junction by the short-circuited transmission line connected thereto in inverted form and after a time delay such that it substantially wholly cancels the portion of the original pulse which is overlapped by the inverted pulse.

4,639,621

GALLIUM ARSENIDE GATE ARRAY INTEGRATED CIRCUIT INCLUDING DCFL NAND GATE

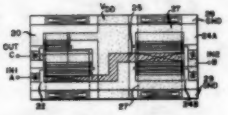
Yasuo Ikawa, Tokyo; Katsue Kawakyu, Kawasaki, and Atushi Kameyama, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 5, 1985, Ser. No. 804,744

Claims priority, application Japan, Mar. 28, 1985, 60-64424

Int. Cl.⁴ H03K *19/094, 19/20, 19/017*

U.S. Cl. 307—450 **4 Claims**



1. A gallium arsenide gate array integrated circuit comprising:

a plurality of direct-coupled field effect transistor logic NAND gates connected between a power source and a ground potential, each of said logic gates including:

a normally-on type field effect transistor functioning as a load transistor having an output terminal and a drain connected to the power source; and

a plurality of normally-off type field effect transistors functioning as at least two independent driver transistors having respective input terminals and series-connected between the power source and the ground potential through the load transistor, one of which driver transistors includes a plurality of normally-off type field effect transistors having a common gate connection and parallel-connected to each other so as to jointly constitute a single driver transistor made up by two normally-off type field effect transistors and with said single driver transistor connected to the ground potential by one of its source and drain terminals and to the other of said driver transistors by the other of said source and drain terminals.

4,639,622

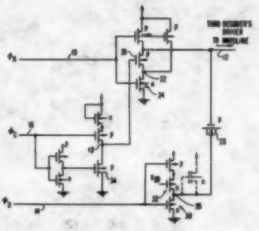
BOOSTING WORD-LINE CLOCK CIRCUIT FOR SEMICONDUCTOR MEMORY

John J. Goodwin, Pleasantville, and Nicky C. Lu, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,521

Int. Cl.⁴ H03K *19/096*

U.S. Cl. 307—482 **13 Claims**



1. A voltage boosting circuit combination comprising a charge/discharge circuit being connectible to sources of first and second voltage levels and including a first plurality of MOSFET's,

an output lead for connection from said charge/discharge circuit to a word-line of a semiconductor memory,

a first input lead having an initially low voltage level clock signal Φ_A thereon connected to said charge/discharge circuit for actuating said MOSFET's to produce a voltage change on said output lead from a first voltage level to a second voltage level when said clock signal Φ_A turns on at time t_1,

a threshold voltage circuit including a second plurality of MOSFET's and a lead connecting said threshold voltage circuit to said charge/discharge circuit for deactivating one of said MOSFET's in said charge/discharge circuit,

a second input lead having an initially high voltage level clock signal Φ_C thereon connected to said threshold voltage circuit and turning off at a time t_3 after time t_1 for controlling the voltage level in said threshold voltage circuit.

an output signal boosting circuit including a third plurality of MOSFET's,

a third input lead having an initially low voltage level clock signal Φ_D thereon connected to said boosting circuit and turning on at a time t_2 between t_1 time and t_3 for actuating said MOSFET's to produce a voltage boosting signal, wherein said clock signals Φ_A and Φ_D are initially off at said low voltage levels and said clock signal Φ_C is initially on at said high voltage level to maintain an output signal on said lead from said threshold circuit to said charge/discharge circuit, and,

means connecting said boosting circuit to said output lead for applying said voltage boosting signal from said voltage boosting circuit to said output lead for boosting the voltage level change on said output lead to a third voltage level from said second voltage level.

4,639,623

HIGH SENSITIVITY SIGNAL DETECTOR

Keats A. Pullen, Jr., 2807 Jerusalem Rd., Kingsville, Md. 21087

Filed Jul. 13, 1984, Ser. No. 630,458

Int. Cl.⁴ G06F *7/556;* **H03K** *5/153*

U.S. Cl. 307—492 **6 Claims**

1. A detector circuit having improved sensitivity comprising:

a direct voltage source;

a load element;

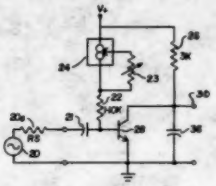
a transistor circuit having a common emitter, a base, and a

collector connected to one end of said load element, said base and emitter forming a base-emitter junction which requires a minimum bias voltage for conduction, said common emitter and an opposite end of said load element connected to said direct voltage source;

a stable bias current source connected to said base connection to supply a stable bias current;

AC coupling means;

a signal source of alternating signals having an internal



impedance less than half the impedance of said base-emitter junction, said signal source being AC coupled to said base and emitter by said AC coupling means;

said bias current selected to provide an operating current for said transistor base-emitter junction which produces a substantially square law response to said alternating signals whereby alternating signals having peak to peak voltage levels less than half said base-emitter junction minimum bias voltage produce a base current magnitude change.

4,639,624

TORQUE MOTOR HAVING A COIL WITH FINITE TURNING RANGE

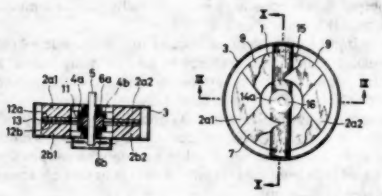
Yuuki Ejiri; Tomoo Ito, both of Katsuta; Hisato Tsuruta, Hitachi, and Hiroshi Kamifuji, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,964

Claims priority, application Japan, Jul. 27, 1984, 59-158258

Int. Cl.[4] H02K *17/32*

U.S. Cl. 310—154 **14 Claims**



1. A torque motor comprising a housing, shaft means extending through said housing and supported by bearing means, a stationary core disposed in said housing, at least one coil fixed to said shaft means and arranged for rotation with respect to said stationary core within a finite range, magnet means fixed to said housing for imparting rotational force to said at least one coil, support means in said housing for fixedly supporting said stationary core, said at least one coil being provided with oppositely disposed free ends and extending across said stationary core between the free ends such that each of the free ends projects beyond an outer peripheral surface of said stationary core without contacting said stationary core, said support means including at least two plate members disposed on opposite sides of said shaft means, and said magnet means being disposed within said housing at portions other than portions where said support means is disposed.

4,639,625

DIRECT-CURRENT MACHINE HAVING PERMANENT MAGNET FIELD SYSTEM

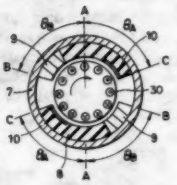
Toshimi Abukawa, Hitachiohta; Kazuo Tahara; Noriyoshi Takahashi, both of Hitachi; Fumio Tajima, Jyuoh, and Tosio Tomite, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1985, Ser. No. 768,323

Claims priority, application Japan, Aug. 29, 1984, 59-178348

Int. Cl.[4] H02K *21/26*

U.S. Cl. 310—154 **11 Claims**



1. A direct-current machine comprising: a rotor including an armature core, an armature winding and a commutator; and a stator including a yoke, and permanent magnets and auxiliary poles both placed side by side on the inner peripheral surface of said yoke, and

a member of a high saturation magnetic flux density material which is placed on a part of a pole face of each of the permanent magnets, said part facing an air-gap and being under the influence of a demagnetizing field.

4,639,626

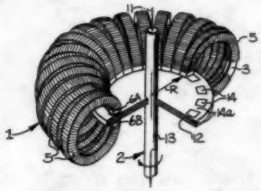
PERMANENT MAGNET VARIABLE RELUCTANCE GENERATOR

Daniel W. McGee, Fairfield, Iowa, assignor to Magnetics Research International Corporation, Fairfield, Iowa

Filed Apr. 26, 1985, Ser. No. 727,441

Int. Cl.[4] H02K *21/38*

U.S. Cl. 310—155 **27 Claims**



1. A variable magnetic reluctance generator comprising:

stator means having a pair of fixed spaced poles of opposite magnetic polarity, each pole forming a continuous and smooth surface ring without surface discontinuities, the two rings together defining an annular gap having a magnetic field between the poles with the field intensity being uniform along the length of the annular gap, and magnetically permeable means for providing a magnetically permeable path connecting the poles;

at least one fixed stator winding surrounding the magnetically permeable path means; and

rotor means having alternating segments of high and low magnetic permeability, said rotor mean disposed for rotation with said segments of alternating high and low magnetic permeability remaining within and moving through the length of said gap between the opposite polarity poles, whereby the changes in the magnetic permeability of the gap between the opposite polarity poles resulting from the rotation of the rotor means causes variations in the magni-

tude but not direction of the magnetic flux in the associated magnetically permeable path means, which induces an electrical current in the surrounding stator winding.

4,639,627

INTERLOCKING YOKE AND ENDPLATES FOR PERMANENT MAGNET ROTOR

Yoshitaka Takekoshi, Hachioji, and Shigeyuki Ushiyama, Hino, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

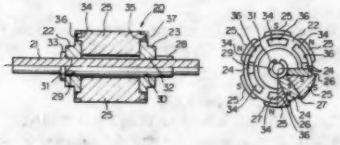
PCT No. PCT/JP84/00199, § 371 Date Dec. 20, 1984, § 102(e) Date Dec. 20, 1984, PCT Pub. No. WO84/04430, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 19, 1984, Ser. No. 691,299

Claims priority, application Japan, Apr. 20, 1983, 58-68338

Int. Cl.⁴ H02K *21/12*

U.S. Cl. 310—156 **5 Claims**



1. A permanent-magnet field rotor, comprising:

a shaft having a cylindrical outer surface;

a pair of end plates secured to said cylindrical outer surface of said shaft and axially spaced from each other, each of said end plates having therein engagement holes spaced circumferentially from each other around the axis of said shaft;

a plurality of permanent magnets arranged circumferentially around the axis of said shaft and axially extending between said end plates to abut at either axial end thereof against said corresponding end plate, each of said permanent magnets having an outer surface and an inner surface in contact with said cylindrical outer surface of said shaft; and

a yoke disposed between each successive pair of permanent magnets to hold said permanent magnets therebetween, said yokes extending axially between said end plates to abut at either axial end of said yokes against said corresponding end plate, each of said yokes being provided at either axial end thereof with an axial protrusion which, when inserted into said corresponding engagement hole of said corresponding end plate, prevents said yoke from moving circumferentially and radially of said shaft and at either outer circumferential corner thereof with a protruding end which is in contact with said outer surface of said corresponding permanent magnet for preventing said permanent magnet from moving radially.

4,639,628

SMALL SIZE MOTOR

Toshiji Kobayashi, and Katsumi Matsumoto, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

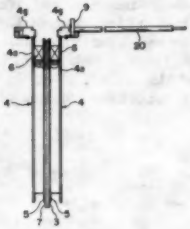
Filed Jul. 19, 1984, Ser. No. 632,170

Claims priority, application Japan, Nov. 8, 1983, 58-171936[U]

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—194 **1 Claim**

1. A small motor, comprising, a core having a plurality of bent pole-teeth at a radial periphery thereof, a coil bobbin having at least one flange portion and a drum portion, said drum portion being fitted onto said core at the other periphery of said pole-teeth, lead wire holding means projecting from said flange portion and connected thereto by hinge portions at the outer periphery of said flange portion, said lead wire holding means connecting a wire wound on said coil bobbin to a lead wire, said hinge portions being formed at sides of said lead wire holding means so as to permit said lead wire holding means to pivot to a position generally axially displaced from a plane of said coil bobbin.



4,639,629

BRUSH-HOLDER FOR FLAT-COMMUTATOR ELECTROMECHANICAL TRANSDUCER

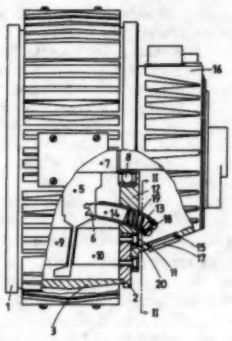
Damien Casanova, Barcelona, Spain, assignor to Mavilor Systemes S.A., Switzerland

Filed Jan. 9, 1985, Ser. No. 689,821

Claims priority, application France, Jan. 13, 1984, 84 00512

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—248 **8 Claims**



1. Brush holder for an electromechanical transducer provided with a flat commutator, comprising guide sockets, characterized by the fact that the guide sockets are curved for receiving curved brushes and so disposed that their first ends register with the commutator and on a virtual circle concentric to the transducer shaft, whereas the second ends remote from said shaft lie on a second virtual circle concentric to said shaft and of radius greater than that of the virtual circle.

4,639,630

PIEZOCERAMIC SERVO-DRIVE FOR PRODUCING TRANSLATIONAL MOTION, ESPECIALLY FOR APPLICATION TO RING LASER MIRRORS

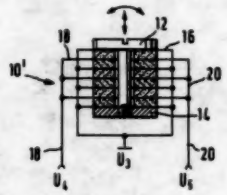
Rüdiger K. Rodloff, Meinersen, and Werner W. Jungbluth, Königslutter, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,324

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412014

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—328 3 Claims



1. A piezoelectric drive for producing translation and angular movement comprising a plurality of first and second piezo discs arranged in a column, said discs being polarized in such a way that the direction of extension of the column and the direction of the electrical field are substantially parallel, said first and second piezo discs each having contact surfaces on the opposite sides thereof, the contact surfaces on said first piezo discs being substantially continuous, the contact surface on one side of each of said second piezo discs being symmetrically divided into a plurality of separate contact segments, each of said contact surfaces and each of said contact segments having a separate electrical contact thereon, means for effecting initial compression of said discs and a support engaging one end of said column and positioning the other end thereof in engagement with a component to be adjusted.

4,639,631

ELECTROSTATICALLY SEALED PIEZOELECTRIC DEVICE

Marc K. Chason, Schaumburg; Carl A. Kotecki, Palatine; Joseph P. Tomase, Libertyville; Michael J. Onystok, Bloomingdale; Donald J. Ryback, Northbrook; Robert G. Kinsman, Naperville; Lawrence N. Dworsky, Northbrook; Kenneth J. Nield, Western Springs, all of Ill., and Steven C. Moore, Mountain View, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1985, Ser. No. 750,455

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—344 43 Claims

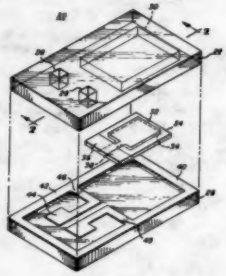
1. A hermetically sealed piezoelectric device package comprising:

a base and cover which are insulators within the operating temperature range of the device;

piezoelectric device mounted between said base and cover and having first and second electrodes;

means for providing electrical connections outside of said package with said first and second electrodes, said connection means including at least a first hole disposed in one of said base and cover and a first metal pad electrically connected to said first electrode, said pad contiguously abutting the periphery of said first hole;

means for electrostatically sealing said cover to said base to hermetically seal said device in the package, said sealing means including a strip of metal disposed contiguous to the periphery of said base and cover, said sealing means utilizing said first pad to form an electrostatic seal about said first hole and utilizing said strip of metal to form a seal about the periphery of said cover and base, thereby hermetically sealing the piezoelectric device inside the package.



4,639,632

PIEZOELECTRIC RESONATOR MOUNTINGS

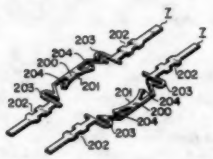
Hozumi Nakata, Iruma, and Tsutomu Yamakawa, Kawagoe, both of Japan, assignors to Nihon Dempa Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 632,408, Jul. 19, 1984, abandoned. This application Oct. 22, 1985, Ser. No. 789,928

Claims priority, application Japan, Jul. 27, 1983, 58-115596; Nov. 7, 1983, 58-171252; Dec. 23, 1983, 58-198264; Dec. 23, 1983, 58-198265; Dec. 27, 1983, 58-198940; Dec. 27, 1983, 58-198941; May 29, 1984, 59-78951

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—351 10 Claims



1. A piezoelectric resonator, comprising:

a case including a pair of plate-like halves each of which has a frame portion along its edge, wherein said frame portions oppose each other and can adhere to each other;

a generally planar piezoelectric element including driving elements at central parts of its upper and lower surfaces, connecting electrodes extending, in opposite directions, from said driving electrodes toward edges of said upper and lower surfaces of the piezoelectric element, and conducting electrodes provided at parts of the edges of said upper and lower surfaces of the piezoelectric element to connect with said connecting electrodes;

a pair of lead-in conductors penetrating side portions of said case generally parallel to each other, said conductors including narrow-width portions which project from central portions of said conductors toward one another, arcuate projections each integrally connected at a central part to free ends of associated ones of said narrow-width portions wherein said projections are curved to extend inwardly of a region bounded by said conductors, and U shaped portions for reducing the effect of thermal conditions and mechanical vibration on said piezoelectric element when supported by said electrodes within said case, wherein the central parts of said arcuate projections of said lead-in conductors are attached and electrically con-

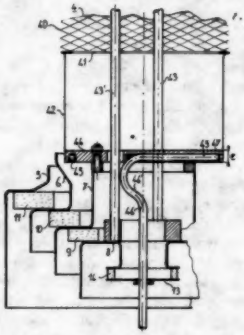
nected to said conducting electrodes at the edge parts of the piezoelectric element by a conductive adhesive agent, and end portions of said arcuate projections are attached to regions of said piezoelectric element outside of the conducting electrode edge parts by an adhesive agent.

4,639,633

ELECTRON TUBE WITH CATHODE COOLING DEVICE

Roger Hoet, and Pierre Gerlach, both of Thonon les Bains, France, assignors to Thomson-CSF, Paris, France

Filed May 7, 1985, Ser. No. 731,546
Claims priority, application France, May 9, 1984, 84 07104
Int. Cl.⁴ H01J *7/26*
U.S. Cl. 313—35 **2 Claims**



1. An electron tube comprising coaxial electrodes including a cathode, an anode and at least a control grid,

means forming with said electrodes a tube envelope,

skirt means within said envelope having a first end and a second end, said first end connected to the cathode,

plate means within said envelope and connected to said second end of said skirt means,

output connection means connected to the plate means and extending through the envelope for providing external connection to the cathode, and

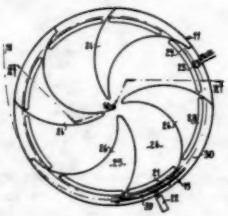
tubular means having a spiral portion with an inlet and an outlet and included within said plate means for flowing cooling fluid for cooling said plate means and said skirt means with little cooling of the cathode.

4,639,634

CYCLOTRON WITH FOCUSSING-DEFOCUSSING SYSTEM

Gabriel Meyrand, Elancourt Marepas, France, assignor to C.G.R. MeV, Duc, France

Filed Apr. 6, 1984, Ser. No. 597,595
Claims priority, application France, Apr. 12, 1983, 83 05939
Int. Cl.⁴ H05H *13/00*
U.S. Cl. 313—62 **7 Claims**



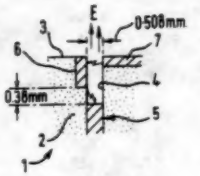
1. A cyclotron having two pole pieces occupying the two axial faces of a relatively flat, cylindrical accelerating cavity, in the center of which is placed a charged particle source and which has means for positioning a target within said cavity, of the type in which the pole pieces have a succession of thick, spaced sectors regularly circumferentially distributed in order to define within the cavity an alternating succession of narrow air gap zones and wide air gap zones in order to ensure the vertical focussing, wherein there is also an arrangement of elongated narrow curved arcuate coils arranged in a circular manner in the vicinity of the periphery of the cavity and means for supplying electric power thereto, in order to vary to defocus the vertical focussing conditions in the vicinity of a circular path corresponding to the radial positioning of the target the coils locally strengthening the fields in the wide air gap regions and locally weakening the field in the narrow air gap regions.

4,639,635

SPARK PLUG

Anthony J. J. Lee, Chelmsford, England, assignor to National Research Development Corporation, London, England

PCT No. PCT/GB83/00253, § 371 Date Jun. 7, 1984, § 102(e) Date Jun. 7, 1984, PCT Pub. No. WO84/01674, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 11, 1983, Ser. No. 619,163
Claims priority, application United Kingdom, Oct. 11, 1982, 8229009; Apr. 29, 1983, 8311904
Int. Cl.⁴ H01T *13/46*
U.S. Cl. 313—123 **12 Claims**



1. A spark plug including means defining a spark cavity having a base, sidewalls, and an exit opening providing a path of escape from the cavity for gases expanding therein,

first electrode means defining a first spark gap across an interior portion of said cavity, and

second electrode means defining a second spark gap extending across said exit opening,

said second electrode means being positioned relative to said first electrode means such that gases escaping from the cavity interior along said path of escape as a result of a spark across said first spark gap must traverse said second spark gap,

said second electrode means further being in series with said first electrode means,

whereby any tendency of said escaping gases to reduce spark current at said second spark gap causes a similar spark current reduction at said first spark gap, thereby reducing the flow of escaping gases and stabilizing the spark currents at said first and second spark gaps.

4,639,636

COLOR DISPLAY TUBE WINDOW, SKIRT AND MOUNT FOR COLOR SELECTION MEANS

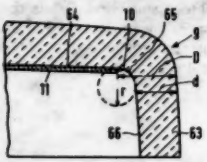
Gijsbertus Bakker, and Gerhardus J. Rorije, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, Tarrytown, N.Y.

Filed May 4, 1984, Ser. No. 607,359

Claims priority, application Netherlands, Dec. 6, 1983, 8304179

Int. Cl.[4] H01J 29/07, 29/24

U.S. Cl. 313—408 2 Claims



1. In a color display tube including an envelope having a neck, a cone and a substantially flat display window which changes into a skirt, said skirt being substantially parallel to the axis of the envelope, by means of a strongly curved portion, an inner surface of the display window changing into the inner surface of said skirt by means of a first strongly curved surface having a radius of curvature r and the outer surface of said display window changing into the outer surface of said skirt by means of a second strongly curved surface, said skirt in proximity of said transition having a thickness d, said display window having on its inside surface a substantially rectangular display screen including a material luminescing in at least one color, color selection means positioned in front of said display screen, and means in said neck to generate at least one electron beam, said display window having a distance D in a plane perpendicular to said tube axis, between the boundary of said luminescent material of said display screen and said outer surface of said skirt of said display window,

the improvement wherein D is substantially equal throughout the circumference of said display window, and wherein the radius r is equal to or less than 10 mm and (D−d)/r is equal to or less than one.

4,639,637

ARC DISCHARGE LAMP HAVING IMPROVED LUMEN MAINTENANCE

Fred R. Taubner, and Joseph A. Roy, both of Danvers, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 27, 1981, Ser. No. 228,865

Int. Cl.[4] H01J 31/00, 31/26

U.S. Cl. 313—489 5 Claims

1. An arc discharge lamp having a light emitting envelope containing an ionizable medium which includes mercury vapor and having electrodes sealed into the ends thereof; and a layer of phosphor on the interior surface of said envelope, the improvement comprising: a layer of submicron size alumina overlying said layer of phosphor, the weight of said alumina being in the range of about 300 to 500 micrograms per square centimeter.

4,639,638

PHOTOMULTIPLIER DYNODE COATING MATERIALS AND PROCESS

John A. Purcell, Hightstown; John T. Puglis, Bridgewater, and Steven W. Duckett, Princeton, all of N.J., assignors to Sangamo Weston, Inc., Norcross, Ga.

Filed Jan. 28, 1985, Ser. No. 695,155

Int. Cl.[4] H01J 1/32, 43/22

U.S. Cl. 313—534 18 Claims

1. In a photomultiplier of the type including a photocathode formed from at least an alkali metal or compound thereof and at least one electron accelerating structure, such as a dynode or the like,

an improved coating for said electron accelerating structure comprising:

at least one layer of a secondary electron emissive material disposed over the electron accelerating structure, the secondary electron emissive material being an alkali halide selected from the group consisting of cesium iodide, cesium bromide, cesium chloride, rubidium bromide, rubidium chloride, potassium bromide, potassium chloride, potassium iodide, lithium fluoride, sodium bromide, sodium chloride, sodium fluoride, and sodium iodide, the coating material coating any free alkali metal present on the surface of the electron accelerating structure whereby the photosensitivity of the electron accelerating structure to radiation of wavelengths of 400 nanometers or greater is reduced.

4,639,639

HIGH-PRESSURE SODIUM VAPOR LAMP AND TERNARY AMALGAM THEREFOR

Chikara Hirayama, Murrysville, and Kenneth F. Andrew, Pittsburgh, both of Pa., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 23, 1985, Ser. No. 726,214

Int. Cl.[4] H01J 61/20

U.S. Cl. 313—639 13 Claims

1. A high pressure sodium vapor lamp for operation at a sodium vapor pressure of at least 60 Torr, such lamp comprising an arc discharge tube containing a ternary amalgam of mercury, sodium and a third metal selected from the group consisting of indium, gallium and tin, the atomic proportion of

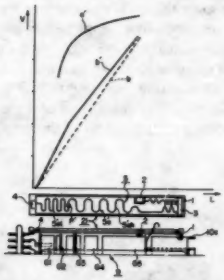
the third metal exceeding that of the mercury but not exceeding that of the sodium in the amalgam, and the atomic proportion of the sodium being at least twice but not over four times that of the mercury.

4,639,640

RESISTORS FOR USE IN CATHODE RAY TUBES

Katsuhiko Hata, and Takahiko Yamakami, both of Aichi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,247
Claims priority, application Japan, Dec. 16, 1983, 58-238244
Int. Cl.[4] H01J *23/16*
U.S. Cl. 315—3 **9 Claims**



1. A resistor for use in a cathode ray tube comprising

an insulating plate provided thereon with at least first and second electrode terminals for use respectively with relatively high and low voltages in the cathode ray tube,

a coating insulator provided on said insulating plate for covering the same, and

a resistive layer provided in a predetermined pattern on said insulating plate for coupling therethrough said first and second electrode terminals with each other and being covered by said coating insulator, said resistive layer being so arranged that the resistance of said resistive layer obtained per unit length on said insulating plate between said second electrode terminal and a high potential difference position between said first and second electrode terminals, where the potential difference between the outer surface of said coating insulator and said resistive layer is to be relatively large in the use of said resistor in the cathode ray tube, is greater than that between said high potential difference position and said first electrode terminal.

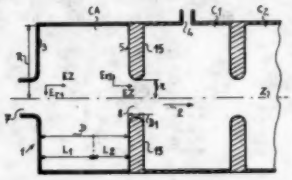
4,639,641

SELF-FOCUSING LINEAR CHARGED PARTICLE ACCELERATOR STRUCTURE

Dominique Tronc, Chatou, France, assignor to C. G. R. MeV, Buc, France

Filed Aug. 27, 1984, Ser. No. 644,540
Claims priority, application France, Sep. 2, 1983, 83 14090
Int. Cl.[4] H01J *25/10*
U.S. Cl. 315—5.41 **4 Claims**

1. In a self focusing linear charged particle accelerator structure, comprising a first accelerating cavity of a succession of accelerating cavities for accelerating a beam of charged particles under the effect of an electromagnetic wave of a given frequency F injected into said structure, said first cavity having an axis merging with a longitudinal axis of said structure and the axis of said beam and comprising an inlet face and an outlet face provided respectively for the passage of said beam with an inlet hole and an outlet hole of a given radius, the distance between said inlet and outlet faces of said first cavity comprising a conventional accelerating length L1, the radius r of the outlet hole being sufficiently small with respect to said accelerating length for the radio 2r/L1 to be less than 1, wherein said distance between said inlet and outlet faces is formed by said accelerating length plus an additional length to delay the time of arrival of the particles at said outlet face, and in which said additional length is chosen so that the outlet face



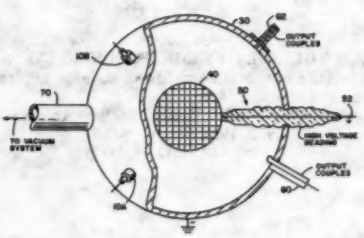
corresponds to a region where the particles in the beam which have been bunched in transit through the first cavity no longer experience a radial divergent electric field component of the electromagnetic field at said outlet hole.

4,639,642

SPHERICON

Thomas G. Roberts, Huntsville, and Thomas E. Honeycutt, Somerville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,391
Int. Cl.[4] H01J *7/46, 19/80*
U.S. Cl. 315—39 **10 Claims**



1. A RF energy producing device comprising a spherical outer electrode; first means for producing electrons; second means for injecting the electrons inside said spherical electrode; a second spherical inner electrode positioned symmetrically inside said outer electrode; third means connected to said inner electrode so as to make said inner electrode a positive voltage potential relative to said outer electrode; and said inner electrode being substantially open in construction so that most electrons will be accelerated by the voltage potential and will not be collected by the inner electrode but will oscillate about the electrodes creating RF energy.

4,639,643

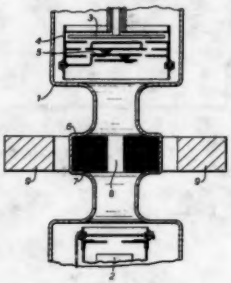
THYRATRON INTERRUPTERS

Timothy P. Donaldson, Great Totham, and Hugh Menown, Writtle, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Nov. 12, 1981, Ser. No. 320,682
Claims priority, application United Kingdom, Nov. 15, 1980, 8036736
Int. Cl.[4] H05B *37/00, 39/00, 41/00*; H01J *11/04, 13/48, 15/04, 17/36*
U.S. Cl. 315—344 **19 Claims**

1. A thyratron interruptor comprising: discharge means for generating a discharge current comprising an anode electrode, a control grid and a cathode electrode, said discharge means

having a space between said anode and cathode electrodes for the discharge current to flow with said control grid being disposed in said space; and quenching means for selectively causing the recombination of ions and electrons in the discharge to quench the discharge, said quenching means comprising a quenching structure which is disposed in said space between said anode and cathode electrodes in addition to said



control grid, with said structure including plural surfaces, whose potential may float during normal operation, disposed along the direction of the discharge current flow and presenting a passage therethrough for the discharge current flow, and control means for selectively moving the discharge current flow into contact with said plural surfaces to cause the recombination of ions and electrons in the discharge.

4,639,644

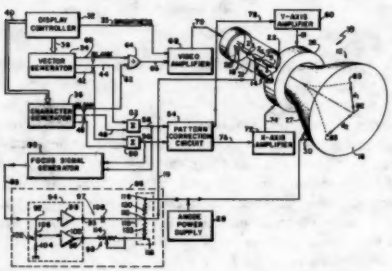
HIGH VOLTAGE DYNAMIC FOCUSING SYSTEM

Lawrence H. Skow, Marlboro, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 575,081, Jan. 30, 1984. This application Apr. 3, 1986, Ser. No. 847,103

Int. Cl.[4] H01J *29/58*

U.S. Cl. 315—382 **16 Claims**



8. A display system comprising:

a display screen having a plurality of display positions;

means for projecting an electron beam onto a nominal display position on the display screen;

means for positioning the projected electron beam to display positions on the display screen other than the nominal display position in accordance with positioning signals;

means, responsive to the positioning signals, for generating a variable focusing signal;

means for focusing the projected electron beam at each display position on the display screen to which the projected electron beam is positioned; and

a circuit, responsive to the variable focusing signal, for producing a composite focusing signal and coupling said composite focusing signal to the focusing means, said circuit comprising:

(a) means, fed by the variable focusing signal, for producing a first amplified, variable focusing signal at a first output port, and a second amplified, variable focusing signal at a second output port;

(b) means, including a capacitor coupled to the first output port, for coupling the first amplified, variable focusing signal through the capacitor to produce a capacitively coupled, first amplified, variable focusing signal;

(c) means for producing a first predetermined reference voltage; and

(d) combining means for coupling the first predetermined reference voltage producing means to an output terminal to provide a nominal focusing voltage at the output terminal, for combining therewith at the output terminal the capacitively coupled, first amplified, variable focusing signal and the second amplified, variable focusing signal to produce the composite focusing signal at the output terminal, and for attenuating the nominal focusing voltage produced at the output terminal to a predetermined factor thereof at the second output port of the amplifying means.

4,639,645

DRIVE SYSTEM FOR A.C. MOTORS

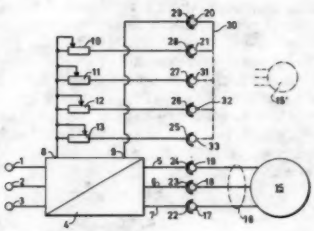
Carl S. M. Hartwig, Taby, Sweden, assignor to Institut Cerac S. A., Ecublens VD, Switzerland

Filed Jul. 10, 1985, Ser. No. 753,497

Claims priority, application Switzerland, Aug. 1, 1984, 3710/84

Int. Cl.[4] H02P *7/74*

U.S. Cl. 318—51 **10 Claims**



1. A machine drive system comprising:

at least two brushless AC motors (15) having mutually distinct working characteristics, each of said motors being adapted to be responsive to specific electrical input power having particular parameters;

a static converter means (4) having a common output (5, 6, 7) and a control input (8, 9), said converter means being adapted to be connected to said motors and to selectively provide from said common output said specific electrical input power having particular parameters;

circuit means connecting said motors, one at a time to said static converter means, said circuit means having an exclusive connection identification means (10–13; 35; 44; 47) for each motor,

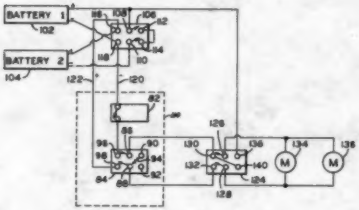
said connection identification means being adapted to set said control input on said converter means whereby said converter means is adjusted to generate the specific electrical input power for the respective motor.

4,639,646

TWO PEDAL, THREE-WAY CONTROL FOR CHILD'S RIDING TOY

Timothy S. Harris, and Lawrence R. Harrod, both of Fort Wayne, Ind., assignors to Kransco Manufacturing, Inc., San Francisco, Calif.

Filed Feb. 4, 1985, Ser. No. 697,838
Int. Cl.[4] H02P 1/22, 3/12
U.S. Cl. 318—139 8 Claims



1. A child's riding toy comprising:

motor drive means;

reversing switch means connected to the motor drive means and having a forward position and a reverse position;

battery power supply means connected to the reversing switch means to supply a plurality of levels of driving current up to a predetermined maximum level through the reversing switch means in one polarity to the motor drive means when the reversing switch means is in its forward position;

a separate connection means connected from the battery power supply means to the reversing switch means for only supplying less than said predetermined maximum level of driving current through the reversing switch means in an opposite polarity when the reversing switch means is in its reverse position, whereby a maximum driving current supplied to the motor drive means when the reversing switch means is in its reverse position is less than and of opposite polarity to the predetermined maximum level of driving current supplied to the motor drive means when the reversing switch means is in its forward position;

the battery power supply means comprising means to supply, selectively, high and low battery voltages to the reversing switch means, thereby to supply said driving current in one polarity to the motor drive means when the reversing switch means is in its forward positon;

spring-biased switching means connected between the battery power supply means and the reversing switch means normally to disconnect the battery power supply means from the reversing switch means, whereby no driving current will normally be supplied to the motor drive means, the spring-biased switching means being actuable by a driver of the toy to supply the driving current to the motor drive means in a polarity determined by a position to which the reversing switch is set; and

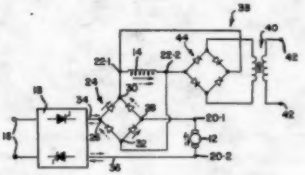
a dynamic braking load connected to the spring-biased switching means to be connected thereby to the reversing switch means when the spring-biased switching means is in a normal position, whereby current generated by the motor drive means when the spring-biased switching means is not actuated can flow through the dynamic braking load.

4,639,647

FOUR QUADRANT CONTROL OF SERIES MOTORS

Bonne W. Posma, 1 Main St., Youngstown, N.Y. 14174

Filed Mar. 19, 1985, Ser. No. 713,546
Claims priority, application South Africa, Apr. 4, 1984, 84/2499; Nov. 27, 1984, 84/9258
Int. Cl.[4] H02P 7/12
U.S. Cl. 318—247 16 Claims



1. A method of controlling at least one series motor which includes connecting rectifier means in series with the motor so that current through a field winding of the motor is always in the same direction irrespective of the polarity of the input voltage while the current direction through an armature of the motor reverses in accordance with the polarity of the input voltage, applying an energizing current to the field winding to ensure that the field winding always produces some flux during operation of the motor, and detecting a regenerative condition of the motor, and when detected, causing a switching action to take place to isolate the field winding from the armature thereby to change the series motor to an equivalent shunt motor.

14. A controller for controlling at least one series motor, the controller comprising:

control means operable to vary the polarity and voltage supplied to the motor;

rectifier means intermediate the control means and the motor for supplying current in one direction only through a field winding of the motor irrespective of the polarity of the voltage supplied by the control means and for supplying current with reversible polarity to an armature of the motor in accordance with polarity of the voltage as supplied by the control means;

bias power supply means connectable to the field winding for producing field flux during all stages of operation of the motor to produce counter EMF when the motor rotates, whether or not armature current flows; and

means for detecting a regenerative condition of the motor and for operating a switch means when said regenerative condition is detected to isolate the field winding from the armature.

4,639,648

THREE-PHASE BRUSHLESS MOTOR

Satoshi Sakamoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 654,004, Sep. 12, 1984, Pat. No. 4,585,979. This application Jan. 24, 1986, Ser. No. 822,159
Claims priority, application Japan, Feb. 18, 1985, 60-29503
Int. Cl.[4] H02K 29/08
U.S. Cl. 318—254 19 Claims

1. A three-phase brushless motor in which two electromagnetic transducer elements to detect a rotational position of a rotor having a plurality of magnetic poles disposed so as to produce a composite signal having a phase difference of 120° relative to respective output signals from said two electromagnetic transducer elements, said output signals from said two electromagnetic transducer elements and said composite signal are used to determine a drive current which will be fed to a stator coil, characterized in that auxiliary magnetic poles having opposite polarities to those of main magnetic poles on said rotor are disposed on said rotor in opposing relationship to said

electromagnetic transducer elements and at a positions on said rotor with an electrical angle of substantially ±45° from a boundary between respective North poles and South poles of

said main magnetic poles, whereby waveforms of said composite signal and said output signals from said electromagnetic transducer elements have a steep slope at zero-crossing points.

4,639,649

MOTOR CONTROL DEVICE

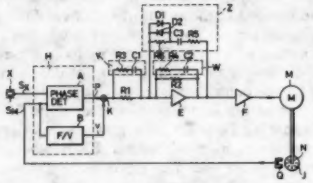
Kaoru Seto, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 563,793, Dec. 21, 1983, abandoned. This application Mar. 6, 1986, Ser. No. 838,394

Claims priority, application Japan, Dec. 29, 1982, 57-231516

Int. Cl.⁴ H02P *5/16*

U.S. Cl. 318—314 **7 Claims**



1. A motor control device comprising speed detection means for detecting a motor speed and for generating a detection signal having a frequency depending on the motor speed; reference signal generating means for generating a reference signal having a reference frequency; and control means for controlling the motor speed; wherein said control means includes:

means for detecting a phase difference between the reference signal and the detection signal and for generating a phase difference signal depending on the phase difference;

means for generating a speed signal depending on the frequency of the detection signal;

combining means for combining the phase difference signal and the speed signal and for generating a control signal for controlling the motor speed; and

error-eliminating means for substantially eliminating from the control signal, generated by said combining means, a phase error component resulting from the phase difference between the reference signal and the detection signal when the phase error component exceeds a predetermined level during the phase synchronization pull-in period, and for providing the control signal from which the error component has been eliminated to said motor.

4,639,650

CONTROL SYSTEM FOR A COOLING FAN IN AN IMPACT PRINTER

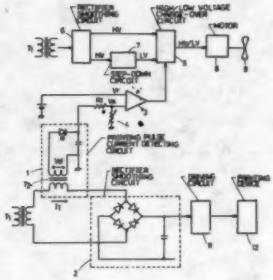
Toshihiko Nakai, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 701,615

Claims priority, application Japan, Feb. 17, 1984, 59-021623[U]

Int. Cl.⁴ G05B *5/00;* **B41J** *19/00*

U.S. Cl. 318—333 **3 Claims**



1. In a control system for an impact printer having a printing device, a driving circuit for diving the printing device, a cooling fan, and a motor for driving the cooling fan, the improvement comprising:

first means for detecting a current for driving the printing device, said current for driving being indicative of the printing rate of the printing device, and for producing an output voltage which is dependent on the current;

comparator means for comparing the output voltage of the first means with a reference value and producing a difference level which is dependent on the comparison;

second means for selectively supplying a first current, proportional to a high voltage, to the motor or a second current, proportional to a low voltage, to the motor; and

change-over means, responsive to the difference signal of the comparator means, for controlling the current selected to be supplied by said second means so as to supply said first current to the motor for driving the fan when a high level difference signal is outputted from said comparator means, said high level difference signal being indicative of a high printing rate in the printing device, so as to increase the motor speed for driving the fan or to supply said second current to the motor when a low level difference signal is outputted from said comparator means said low level signal being indicative of a low printing rate in the printing device so as to decrease the motor speed for driving the fan.

4,639,651

ELECTROMAGNETIC SERVO DEVICE

Yasuo Shimizu, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,641

Claims priority, application Japan, Oct. 26, 1984, 59-225456

Int. Cl.⁴ G05B *11/10*

U.S. Cl. 318—432 **5 Claims**

1. In an electromagnetic servo device (200) including:

an input shaft (1);

an output shaft (4);

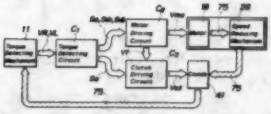
electric motor means (18) for producing auxiliary torque to be applied to said output shaft (4);

electromagnetic clutch means (41) for transmitting motor torque of said motor means (18) as the auxiliary torque to said output shaft (4);

torque detection means (11) for detecting steering torque (Ti) acting on said input shaft (1); and

driving control circuit means (100) adapted for, in accordance with an output signal (VR, VL) from said torque detection means (11), providing:

a first control signal (Vmo), to thereby feed an armature current (Io) of a controlled quantity in a controlled direction, to said motor means (18); and



a second control signal (Vc1), to thereby control, said clutch means (41),

an improvement comprising:

said second control signal (Vcl) having fed back thereto a signal (Vf) according to the actual quantity of said armature current (Io).

4,639,652

CONTROL SYSTEM FOR ROBOT MANIPULATOR

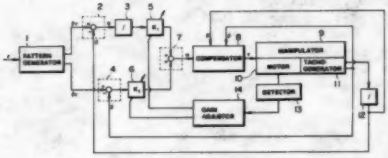
Tohru Takahashi, Yokosuka, and Kunihiko Kurami, Kawasaki, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jun. 18, 1985, Ser. No. 746,021

Claims priority, application Japan, Jun. 19, 1984, 59-124472

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568 **2 Claims**



1. A control system for a controlled body whose motion is controlled by the output of an electric motor comprising:

a source providing electric current for the motor;

a feedback loop providing feedback signals from the output of the motor to the source including means for adjusting gain in the feedback signals;

means for detecting a value representing electric current supplied from said source for driving the motor;

means for comparing the detected value with a predetermined band having maximum and minimum levels based on the saturated electric current level of the motor; and

means responsive to the comparison for adjusting the feedback gain so that the detected value is maintained within said predetermined band to control the characteristic motion of the controlled body.

4,639,653

METHOD AND APPARATUS FOR PERFORMING WORK IN A THREE DIMENSIONAL SPACE

Robert L. Anderson, Boulder; James A. Pilarski, Northglenn, and Jerry A. Klintz, Boulder, all of Colo., assignors to Applied Microbotics Corporation, Boulder, Colo.

Filed Apr. 15, 1985, Ser. No. 723,552

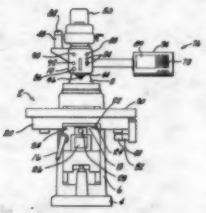
Int. Cl.[4] G05B *11/28*

U.S. Cl. 318—599 **43 Claims**

1. A method for controlling the relative movement of a workpiece and a tool in a three dimensional space so as to perform desired operations on the workpiece comprising:

providing a motor control means for moving at least one of said workpiece and tool in a direction along an x, y or z axis; and

generating a signal by concurrently performing a first set of tasks including foreground tasks, midground tasks and background tasks;



transmitting said signal to a motor control board;

generating another signal by said motor control board by concurrently performing a second set of tasks including foreground tasks, midground tasks and background tasks; and

using said another signal to operate said motor control means.

4,639,654

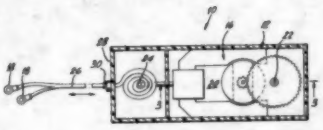
EMERGENCY GENERATOR BATTERY SYSTEM

Benjamin D. Braxton, and George Spector, both of 233 Broadway, Rm 3615, both of New York, N.Y. 10007

Filed Jul. 2, 1985, Ser. No. 751,504

Int. Cl.[4] H02J *7/00*

U.S. Cl. 320—2 **2 Claims**



1. An emergency generator for a battery which comprises:

(a) a housing with a handle;

(b) a magneto power source mounted within said housing;

(c) electric leads on a reel within said housing; and

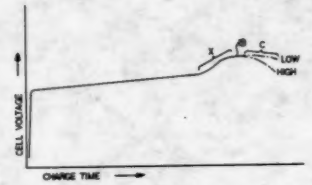
(d) a pair of terminal rings mounted on end portions of said leads which extend externally from said housing and a crank for actuating said magneto mounted on said housing, said crank being rotatable about an axis parallel to the axis of rotation of said reel, wherein said reel is spring biased to the reeled-in position and said leads are in the form of a cable that extends outwardly through a side of said housing in a direction transverse to said crank axis; including a spring lock latch mounted on said side of said housing to engage with said cable so that said cable can be pulled out and locked by said latch to any desireable length as needed.

4,639,655

METHOD AND APPARATUS FOR BATTERY CHARGING

Lawrence A. Westhaver, 8609 Portsmouth Dr., Laurel, Md. 20708, and Ronald E. Ruksznis, 5488 Halflight Garth, Columbia, Md. 21045

Filed Apr. 19, 1984, Ser. No. 601,958
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—14 7 Claims



1. A method of charging a battery and terminating the charging thereof upon determination of the existence of a prescribed condition comprising the steps of:

applying charging current to the battery;

measuring the battery voltage soon after the charging current is applied;

determining, on the basis of said battery voltage measurement, the knee voltage of the charging characteristic of the particular battery being charged;

calculating a battery voltage limit beyond which no further charging current is to be applied, said voltage limit being the point at which the instantaneous battery voltage is a pre-determined value greater than the knee voltage of the battery's charging characteristic;

continued measuring of the battery voltage as said charging current is applied; and

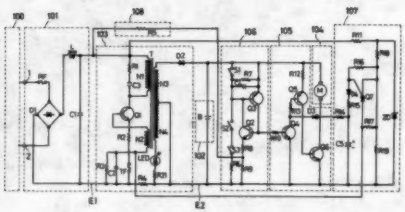
terminating the application of charging current when said battery voltage limit is reached.

4,639,656

ELECTRICAL APPARATUS CONNECTED WITH A BATTERY CHARGER SYSTEM

Kiyotaka Mukai, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 2, 1985, Ser. No. 729,689
Claims priority, application Japan, May 4, 1984, 59-65748[U]; May 4, 1984, 59-65749[U]; Aug. 3, 1984, 59-120501[U]
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—22 10 Claims



1. An electrical apparatus connected with a battery charger system comprising;

a rechargeable battery,

a charge current source for supplying charge current to said battery and electrically connected to said battery, means for controlling said charge current supplied to said battery, said charge current controlling means changing large current for fast charging into small current for normal charging of said battery by said charge current supplied thereto, said charge current controlling means being interconnected between said battery and said charge current source and disposed therebetween,

electrical load means supplied with load current from said battery and electrically connected to said battery,

switching means interconnected between said battery and said load means for switching between a conduction and a non-conduction state for controlling the supply of said load current to said load means from said battery,

switch-operating means interconnected between said battery and said switching means for operating said switching means to switch between said conduction state and said non-conduction state, and

fast-charging-period controlling means electrically connected to said charge current source, said switching means and said charge current controlling means for controlling the supply of said large current for fast charging by said charge current controlling means,

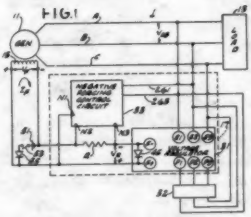
said fast-charging-period controlling means comprising a capacitor capable of being charged to a potential indicative of the time required to charge said battery to a value sufficient to operate said load means for a fixed period of time and discharged across a resistor and said switching means, said charge current controlling means enabling rapid flow of said large current used for fast charging to said battery during the interval when the charge voltage of said capacitor is raised to said indicative potential and thereafter enabling said small current for said normal charging to flow through said charge current controlling means; whereby said battery for operating said load means can be rapidly charged to a value sufficient to permit the operation thereof for said period while enabling normal charging of said battery thereafter.

4,639,657

ELECTRICAL CONTROL APPARATUS AND METHODS

Waldo J. Frierdich, Highland, Ill., assignor to Basler Electric Company, Highland, Ill.

Filed Aug. 30, 1984, Ser. No. 645,559
Int. Cl.[4] H02P 7/12
U.S. Cl. 322—59 39 Claims



1. For use in an electrical power generating system including a generator for supplying an A.C. output voltage to a load on a set of lines, means responsive to the A.C. output voltage for producing a regulating voltage, the generator having a winding the D.C. energization of which controls the A.C. output voltage, and an electrical resistance for connection between the winding and the voltage regulating means, apparatus for controlling the energization of the winding comprising:

switching means adapted to be connected across the resistance and which when rendered conductive bypasses the resistance to couple the regulating voltage from the volatage regulating means to the winding with negligible loss of energy;

means for producing a signal when an increase in the A.C. output voltage exceeding a preselected parameter occurs;

means for rendering the switching means nonconductive in response to the signal thereby causing the resistance to consume energy from the winding; and

means directly responsive to the regulating voltage for ren-

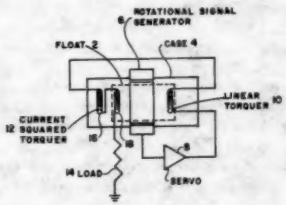
dering the switching means conductive when the regulating voltage rises above a predetermined value.

4,639,658

FLOAT STABILIZED CONSTANT CURRENT SOURCE

Jeffrey W. Hegg, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 23, 1986, Ser. No. 854,960
Int. Cl.⁴ G05F 1/00
U.S. Cl. 323—204 **6 Claims**



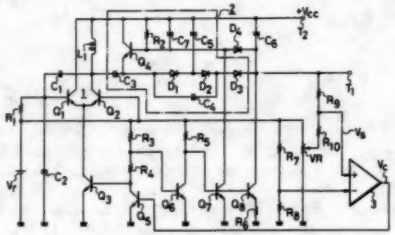
1. A current source comprising
a current output circuit,
a floated cylinder means including a floated cylinder,
a first torquer means arranged to produce a torque on said cylinder directly proportional to an electrical current,
a second torquer means arranged to produce a torque on said cylinder directly proportional to the square of an electrical current and opposite to the torque produced by said first torquer means,
signal generator means for producing an output current representative of a rotation of said cylinder and
servo means for supplying a feedback connection for the output current from said generator means to a series connection of said first and second torquer means and said output current circuit.

4,639,659

DC-DC CONVERTER

Taiwa Okanobu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1986, Ser. No. 842,252
Claims priority, application Japan, Apr. 5, 1985, 60-72193
Int. Cl.⁴ G05F 1/46
U.S. Cl. 323—224 **9 Claims**



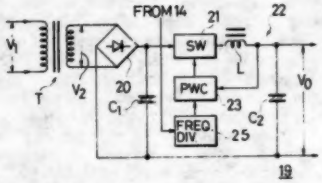
1. A DC-DC converter comprising:
oscillation circuit means having an oscillating state in which an oscillation output is provided and a stop state;
an output terminal;
a voltage source line for receiving a power source voltage;
voltage-multiplying rectifier means receiving said power source voltage from said voltage source line and connected to said oscillation circuit means to receive said oscillation output in said oscillating state and to then generate a rectified output having a voltage which is at least two times the peak voltage of said oscillation output and which is superposed on said power source voltage to provide an output voltage at said output terminal which is higher than said power source voltage;
a series circuit formed of a resistor and a diode and being connected between said voltage source line and said output terminal; and
voltage dividing means connected between a connection point of said resistor to said diode in said series circuit and a ground so that, in said stop state of said oscillation circuit means, said power source voltage is divided by said voltage dividing means for obtaining an output voltage at said said output terminal which is lower than said power source voltage.

4,639,660

SWITCHING CIRCUIT FOR A POWER SUPPLY IN A SIGNAL PROCESSING APPARATUS

Masayuki Yoshida, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 19, 1985, Ser. No. 713,676
Claims priority, application Japan, Mar. 19, 1984, 59-39385[U]
Int. Cl.⁴ G05F 1/44
U.S. Cl. 323—266 **3 Claims**



1. In a signal processing apparatus for processing signals in synchronism with a first clock signal having predetermined frequency, a source of said first clock signal, a source of non-stabilized DC voltage, and a switching means connected to receive said DC voltage and to provide an output voltage to a power supply line, the improvement comprising:
a frequency divider means adapted to receive said first clock signal and to generate a second clock signal having a frequency which is in an integer ratio relationship with said predetermined frequency, said switching means being driven by said second clock signal whereby said switching means is adapted to interrupt said non-stabilized DC voltage intermittently to provide a DC output voltage, and
electric power supplying means responsive to said second clock signal for regulating said switching means such that the DC output voltage to be supplied to said electric power supply line is set equal to a predetermined voltage value.

4,639,661

POWER-DOWN ARRANGEMENT FOR AN ECL CIRCUIT

Bertrand J. Williams, San Jose, and Stanley Wilson, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 3, 1985, Ser. No. 772,211
Int. Cl.⁴ G05F 3/20
U.S. Cl. 323—317 **20 Claims**

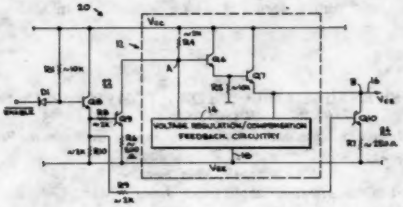
1. A circuit arrangement for reducing a reference supply voltage level of a reference generator for an ECL circuit during a power-down mode comprising in combination:
the ECL circuit including:
a first transistor having its collector connected to a supply

potential via a first resistor and its base connected to an input logic signal;

a second transistor having its collector connected to the supply potential via a second resistor and its base connected to a reference bias voltage;

a constant current source is formed of a third transistor and a third resistor, the collector of said third transistor being connected to the emitters of said first and second transistors, the emitter of said third transistor being connected one end of said third resistor, the other end of said third resistor being connected to a supply voltage source;

a fourth transistor having its collector connected to the



supply potential, its base connected to the collector of said first transistor and its emitter connected to an inverted output terminal; and

a fifth transistor having its collector connected to the supply potential, its base connected to the collector of said second transistor and its emitter connected to a non-inverted output terminal;

reference generator means having a reference supply voltage connected to the base of said third transistor; and

switching means connected to the input of said reference generator means for disabling of the input of said reference generator means in response to a control signal so as to reduce the reference supply voltage level.

4,639,662

THYRISTOR CIRCUIT FOR CURRENT REGULATION

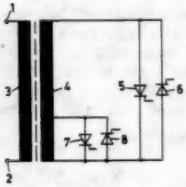
Georg Mastner, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 9, 1984, Ser. No. 639,000

Claims priority, application Switzerland, Aug. 18, 1983, 4509/83

Int. Cl.⁴ G05F *1/32*

U.S. Cl. 323—343 **6 Claims**



3. A circuit for producing a regulated d.c. current, comprising:

a transformer comprising plural inductively coupled windings including a first winding having two primary connections for connecting of the thyristor circuit to an electric circuit, and a second winding;

at least a first bipolar thyristor switch connected between a first two connections of said second winding;

at least a second bipolar thyristor switch connected between a second two connections of said second winding;

said second winding having N_1 turns between the first two connections and N_2 turns between the second two connections, wherein $N_2 < N_1$;

a full-wave rectifier connected to said first connections of said secondary windings, said full-wave rectifier having an output;

a smoothing capacitor connected to said output of said full-wave rectifier;

a regulator connected to the capacitor and the output of said full-wave rectifier for producing an output signal if the voltage at the output of said rectifier exceeds a predetermined value;

at least a first firing pulse generator having a trigger input connected to the output of said regulator for producing a firing output connected to a triggering input of said first bipolar thyristor switch;

a delay circuit connected to the output of said regulator;

a second firing pulse generator connected to an output of said delay circuit and having an output connected to a triggering input of said second bipolar thyristor switch, said delay circuit exhibiting a delay time greater than a firing delay of said first bipolar thyristor switch.

4,639,663

FLY-BACK TRANSFORMER WITH REDUCED RINGING

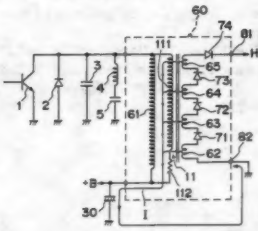
Michio Ueno, Kyoto; Toshimi Miyagi, Kusatsu, and Seji Yamaguchi, Yokohama, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 21, 1986, Ser. No. 821,054

Claims priority, application Japan, Jan. 23, 1985, 60-11560

Int. Cl.⁴ H01F *27/42*

U.S. Cl. 323—356 **3 Claims**



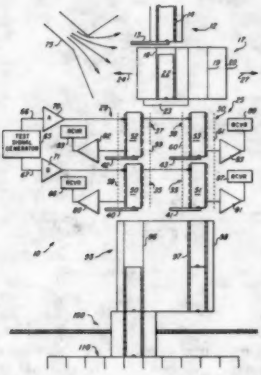
1. A fly-back transformer wherein a primary winding and a secondary winding are provided, a ringing removing winding which is connected with the secondary winding through the distributed capacity with respect to the secondary winding to form a closed circuit of the ringing current together with said secondary winding is connected in parallel to said primary winding through a DC resistance component, said primary winding and said ringing removing winding satisfy a relation formula of $0.85 \leqq M/L1 \leqq 1$, wherein L1 is the inductance of the primary winding, M is the mutual inductance between the primary winding and the ringing removing winding, the impedance between said primary winding and the secondary winding has a value larger with respect to the frequency of the ringing current than a value of the DC resistance component added to the impedance between the ringing removing winding and the secondary winding.

4,639,664

APPARATUS FOR TESTING A PLURALITY OF INTEGRATED CIRCUITS IN PARALLEL

Anthony M. Chiu, Richardson, Tex.; Mark D. Allison, Boise, Id.; James W. Jones, Singapore, Singapore; Lyndale A. Trammell, Baguio City, Philippines, and Fock San Ho, Singapore, Singapore, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1984, Ser. No. 615,979
Int. Cl.⁴ G01R *31/28*; B07C *5/00*
U.S. Cl. 324—73 AT **12 Claims**



1. Apparatus for parametrically and functionally testing integrated circuit devices in parallel, comprising:

at least one integrated circuit receiving channel defining a plurality of integrated circuit device test stations therealong;

load means for automatically delivering via the integrated circuit receiving channel to each of the plurality of integrated circuit device test stations a separate integrated circuit device for testing;

means for delivering parametric and functional test signals at least functionally in parallel to each of said integrated circuit device test stations;

means at each of said test stations for selectively engaging the delivered integrated circuit device to apply the parameter test signals to the integrated circuit device at said test station;

means for receiving an output from each test location in response to the test signals; and

means for determining from said output the parameters of each tested integrated circuit device.

4,639,665

SENSING SYSTEM FOR MEASURING A PARAMETER

James R. Gary, Elk Grove Village, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 22, 1983, Ser. No. 525,520
Int. Cl.⁴ G01R *33/00, 19/00*
U.S. Cl. 324—117 H **13 Claims**

1. A sensing system for measuring a parameter, comprising:

a hall element;

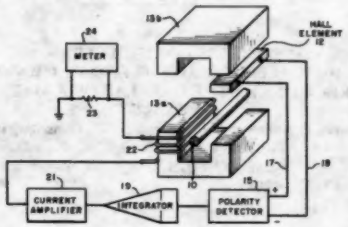
means for establishing, in said hall element, a first magnetic flux having a magnitude which is a function of the parameter to be measured,

said hall element thereby producing a hall voltage having a polarity and an amplitude determined by the first magnetic flux;

a polarity detector, coupled to said hall element, for developing an output voltage of a polarity determined by that of the hall voltage;

an integrator for integrating the output voltage of said polarity detector;

cancelling means for establishing, in said hall element and in response to the integrator output voltage, a second magnetic flux of equal magnitude but of opposite direction



relative to the first magnetic flux, the net flux in said hall element, and the resulting hall voltage, thereby tending to become zero;

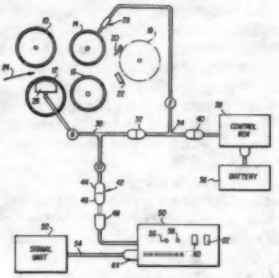
and means, included in said cancelling means, for producing a control voltage which is proportional to and represents the measured parameter.

4,639,666

METAL DETECTOR SENSITIVITY ADJUSTMENT AND TEST ASSEMBLY

Richard P. Strosser, Akron; Carl E. Bohman, New Holland, and Mark K. Chow, Leola, all of Pa., assignors to New Holland, Inc.

Filed Aug. 27, 1984, Ser. No. 644,422
Int. Cl.⁴ G01R *35/00*; G01N *27/72*; A01D *75/18*
U.S. Cl. 324—202 **18 Claims**



5. Apparatus for testing the sensitivity of a metal detector of the type having magnet means for generating a magnetic field, a sensing means for sensing the variations in said magnetic field caused by the movement of a ferrous metal object through said field, and circuit means responsive to said sensing means for producing an output signal, said apparatus comprising:

a magnetic field generator disposed in the vicinity of said sensing means;

means for energizing said magnetic field generator with a sub-audio signal of predetermined magnitude whereby a magnetic field of predetermined intensity is generated in the region of said sensing means to cause said circuit means to produce an output signal which should be within a predetermined range of magnitudes said magnetic field generator being manually movable to and fro in the vicinity of said sensing means;

a visual indicator means of a type capable of indicating the magnitude of an input signal applied thereto; and,

circuit means responsive to said output signal for applying

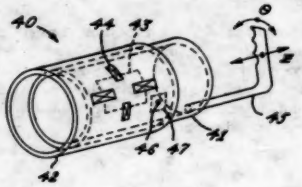
an input signal to said visual indicator means whereby a visual observation of said visual indicator means may be made to determine if the magnitude of said output signal is within said predetermined range of magnitudes, the magnitude of said output signal being proportional to the sensitivity of said metal detector.

4,639,667

CONTACTLESS CONTROLLERS SENSING DISPLACEMENT ALONG TWO ORTHOGONAL DIRECTIONS BY THE OVERLAP OF A MAGNET AND SATURABLE CORES

Herman J. Andresen, 726 Carriage Hill, Glenview, Ill. 60025

Filed May 23, 1983, Ser. No. 496,843
Int. Cl.⁴ G01B 7/14; G08C 19/06
U.S. Cl. 324—208 **6 Claims**



1. A contactless, multi-directional controller of the kind having a reference frame and a carrier, means for guiding the carrier with respect to the reference frame in first and second generally orthogonal directions while restraining motion of the carrier with respect to the reference frame in a third generally orthogonal direction, manipulator means attached to the carrier for manually positioning the carrier with respect to the reference frame in the first and second directions, and contactless sensing means comprising carrier-based means fixed to the carrier and reference-based means fixed to the reference frame, the carrier-based means being adjacent the reference-based means along the third direction, wherein the sensing means comprise first sensing means for sensing the displacement of the carrier with respect to the reference frame in the first direction, and second sensing means for sensing the displacement of the carrier with resect to the reference frame in the second direction,

wherein the improvement comprises,

said carrier and frame are generally cylindrical, said carrier is telescopingly received in said frame, the first and second directions are the axial and circumferential directions of the cylinder of the carrier, and the third direction is the radial direction of the cylinder of the carrier; and

said sensing means comprise at least one magnet and at least two pairs of magnetically saturable cores overlapped by said magnet, each pair of said cores being associated with a respective one of the two directions, the proportional part of each core that is saturated sensing the displacement of the carrier along the associated direction.

4,639,668

ANALOG MANIPULATOR WITH PROXIMITY DETECTION OF A MOVEABLE MAGNETIZABLE MASS

Pierre Petit, Champniers, and Jean-Marie Periot, La Couronne, both of France, assignors to La Telemecanique Electrique, France

Filed Feb. 7, 1985, Ser. No. 699,099
Claims priority, application France, Feb. 8, 1984, 84 01917
Int. Cl.⁴ G01B 7/14; G05G 9/00
U.S. Cl. 324—208 **8 Claims**

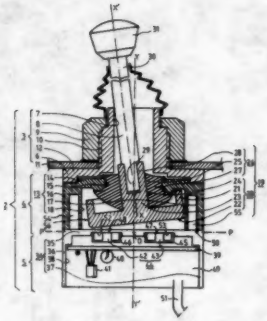
1. An analog manipulator comprising :

a first case of prismatic shape which has an upper wall provided with a central opening, side walls extending perpendicularly to said upper wall, and a lower open face, said upper wall and said side walls delimiting a cavity;

a magnetizable mass located in said cavity and having an axis XX' and an active face ;

a lever coaxial to said mass and extending opposite said face through said central opening and having a first end secured to said mass, and a second end connected to an operating member;

resilient pivoting and return means formed by an annular



piece made from elastomer material and having a peripheral region secured to said upper wall and a central region through which passes and is secured said lever, and

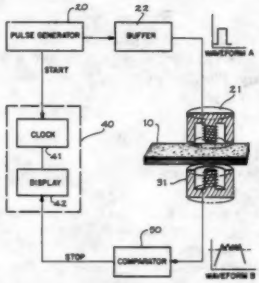
an electronic assembly fixed to said open face of the case and comprising two pairs of proximity detectors facing said active face of said mass, the relative position of said active face and of the detectors being chosen so that a small movement of said mass along said axis generates an identical distance variation between the magnetizable mass and each of said detectors.

4,639,669

PULSED ELECTROMAGNETIC NONDESTRUCTIVE TEST METHOD FOR DETERMINING VOLUME DENSITY OF GRAPHITE FIBERS IN A GRAPHITE-EPOXY COMPOSITE MATERIAL

Darryl A. Howard, Sunnyvale, and Lawrence Y. L. Shen, Saratoga, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Sep. 26, 1983, Ser. No. 535,576
Int. Cl.⁴ G01N 9/24; G01R 33/12
U.S. Cl. 324—239 **3 Claims**



1. A method for nondestructively determining volume density of graphite fibers in a sample of graphite-epoxy composite material, said sample conforming in volume to a reference piece of graphite-epoxy composite material for which the

volume density of graphite fibers is known, said method comprising the steps of:

(a) inductively coupling a first pulse of radio-frequency electromagnetic energy into said reference piece;

(b) receiving energy propagated through said reference piece due to said first pulse;

(c) measuring elapsed time before a time-dependent function of said energy propagated through said reference piece due to said first pulse reaches a value larger than a pre-set threshold value;

(d) inductively coupling a second pulse of radio-frequency electromagnetic energy into said sample, said second pulse being substantially identical in waveform to said first pulse;

(e) receiving energy propagated through said sample due to said second pulse;

(f) measuring elapsed time before a time-dependent function of said energy propagated through said sample due to said second pulse reaches a value larger than said pre-set threshold value; and

(g) calculating a ratio of said elapsed time before said time-dependent function of energy propagated through said sample reaches said threshold value to said elapsed time before said time-dependent function of energy propagated through said reference piece reaches said threshold value, said ratio being substantially equal to the ratio of volume density of graphite fibers in said sample to volume density of graphite fibers in said reference piece.

4,639,670

MAGNETIC FIELD SENSOR COMPRISING WIEGAND WIRES OR SIMILAR BISTABLE MAGNETIC ELEMENTS

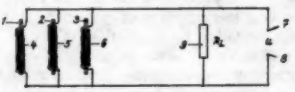
Norbert Normann, Pforzheim, Fed. Rep. of Germany, assignor to Doduco KG Dr. Eugen Durrwachter, Pforzheim, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,769

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406871

Int. Cl.[4] G01R *33/02*

U.S. Cl. 324—260 **4 Claims**



1. In a sensor for sensing an external magnetic field, comprising

wire form bistable magnetic elements and

electrical detector winding means surrounding said bistable magnetic elements,

the improvement residing in that

said bistable magnetic elements comprise a bundle of identical bistable magnetic elements which extend parallel to each other, and

said electrical detector winding means comprise a plurality of electrical detector windings which surround respective ones of said bistable magnetic elements and are wound in the same sense and are electrically connected in parallel.

4,639,671

SIMULTANEOUS NMR IMAGING SYSTEM

Albert Macovski, Menlo Park, Calif., assignor to General Electric Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 499,218, May 31, 1983, abandoned. This application Apr. 24, 1984, Ser. No. 603,333

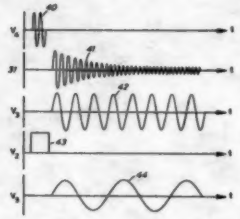
Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **56 Claims**

1. In a method for measuring the NMR activity of points in a volume the steps of:

exciting the volume with an rf excitation signal;

receiving signals emitted from the volume in the presence of a time-varying magnetic field gradients in the three axes; and



processing the received signal to derive information about the NMR activity of points in the volume using a plurality of components of the frequency spectrum of the received signal to derive information about each point.

4,639,672

NUCLEAR MAGNETIC RESONANCE APPARATUS

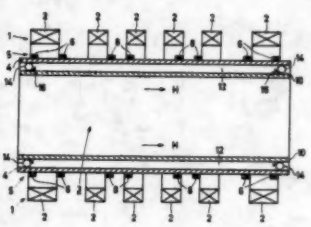
Chrittien J. M. Beaumont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1984, Ser. No. 659,214

Claims priority, application Netherlands, Oct. 14, 1983, 8303534

Int. Cl.[4] G01V *3/00*

U.S. Cl. 324—318 **9 Claims**



1. A nuclear magnetic resonance apparatus comprising an electromagnetic main coil system extending about a generally cylindrical interior area and generating a homogeneous magnetic field in a measuring space within said interior area, a gradient coil system for generating gradient fields in said measurement space, and noise absorbing means disposed between said measurement space and said gradient coil system for reducing, within said measurement space, noise produced by said gradient coil system upon activation thereof.

4,639,673

NUCLEAR MAGNETIC RESONANCE APPARATUS WITH A MAGNET OF PERMANENT MAGNETIC MATERIAL

Hlane Zijlstra, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 19, 1984, Ser. No. 662,651

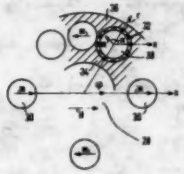
Claims priority, application Netherlands, Jul. 17, 1984, 8402249

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—319 **13 Claims**

1. A nuclear magnetic resonance apparatus comprising a system of magnets for generating a homogeneous main magnetic field in a measuring space, said system comprising a plurality of permanent magnets in the form of elongated bars made of permanent magnetic material, a housing for supporting said bars so that said bars are arranged about said measur-

ing space, and means for mounting at least one of said bars in said housing for movement with respect to said housing and with respect to another of said bars so as to enable the direction



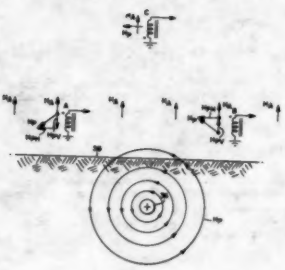
of magnetization of said at least one bar to be changed with respect to the direction of magnetization of said another bar to thereby adjust said magnetic field in said measuring space after installation of said bars in said housing.

4,639,674

APPARATUS AND METHOD EMPLOYING EXTRANEOUS FIELD COMPENSATION FOR LOCATING CURRENT-CARRYING OBJECTS

John B. Rippingale, Leesburg, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed Apr. 11, 1983, Ser. No. 483,613
Int. Cl.[4] G01R *19/00*; G01V *3/08, 3/10*
U.S. Cl. 324—326 **16 Claims**



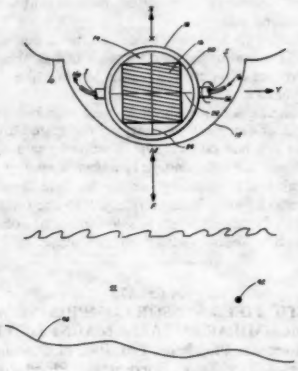
1. Apparatus for locating an obscured elongated object carrying current induced therein by electromagnetic energy propagated from a remote source, the current producing a circumferential magnetic field, comprising first and second sensor means arranged to measure at first and second locations, respectively, a component of said magnetic field and for producing corresponding first and second signals, respectively, portions of said signals being due to measuring by said first and second sensor means of a magnetic field component of said propagated electromagnetic energy, third sensor means for measuring at a third location between the first and second locations said magnetic field component of said propagated electromagnetic energy and for producing a corresponding third signal, said first, second, and third sensor means being positioned at the vertices of an isosceles triangle, with the first and second sensor means located at the base of the triangle, the sensor means having a fixed positional relationship with respect to one another and being movable as a group relative to said object and relative to said remote source, means for combining the signals from the sensor means so as to produce a first resultant signal representative of subtraction of the magnetic field component measured at the third location from the magnetic field components measured at the first location and so as to produce a second resultant signal representative of subtraction of the magnetic field component measured at the third location from the magnetic field components measured at the second location, means for processing the resultant signals, and means responsive to the processing means for indicating the location of the object.

4,639,675

SUPERCONDUCTING CONDUCTIVITY ANOMALY DETECTION SYSTEM

George F. Hinton, Bay St. Louis, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 11, 1984, Ser. No. 629,936
Int. Cl.[4] G01V *3/165*; G01R *33/035*
U.S. Cl. 324—334 **7 Claims**



1. A conductivity anomaly detection system comprising:

a direct current superconducting electromagnet mounted in a moving vehicle within a cryogenic housing for producing a dipole field;

means coupled to said housing for continuously rotating said housing and said electromagnet and its resultant dipole field around a predetermined axis at a predetermined frequency in the direction of motion of said vehicle to produce a rotating magnetic field in the medium over which said vehicle is moving and

sensing means within said housing rigidly mounted in relation to and rotating with said electromagnet for measuring the magnetic field resulting from currents induced in a conducting body of interest located within said medium by said rotating electromagnet.

4,639,676

DEVICE FOR DIAGNOSIS OF TROUBLE IN VEHICLE IGNITION DEVICES

Akio Kawai, Yokohama; Ken Ito, and Hideo Iwamoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

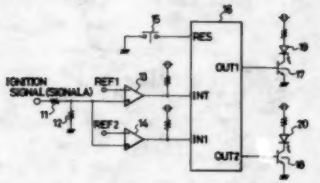
Filed Oct. 18, 1984, Ser. No. 662,028
Claims priority, application Japan, Oct. 19, 1983, 58-194204
Int. Cl.[4] F02P *17/00*
U.S. Cl. 324—380 **8 Claims**

1. In a vehicle ignition device which is constructed to lengthen an electrical discharge time of an ignition coil, a diagnostic device for diagnosing whether or not the longer electrical discharge is occurring normally, comprising:

measuring means connected to a primary side of the ignition coil for measuring a level condition of a voltage on the primary side of the ignition coil;

means connected to said measuring means for determining whether or not the voltage level measured by said measuring means exceeds a predetermined value, said determining means operable only after a predetermined time is elapsed from the time the ignition signal is generated, said

determining means including timer means for measuring said predetermined time; and



indicating means for indicating the result of the determination which is performed by said determination means.

4,639,677

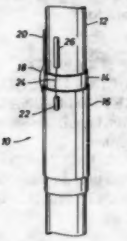
CATHODIC PROTECTION MONITORING SYSTEM

Alvin D. Goolsby, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 336,666, Jan. 4, 1982, Pat. No. 4,489,277. This application Sep. 10, 1984, Ser. No. 649,013

Int. Cl.⁴ G01N *27/00*

U.S. Cl. 324—425 **3 Claims**



1. A method for monitoring the cathodic protection of a partially submerged structure provided by a cathodic protection system, comprising:

establishing a submerged metallic body of material having substantially the same composition as said structure adjacent said structure;

determining that the cathodic protection of said body by said cathodic protection system is substantially the same as the cathodic protection of said structure;

detecting and measuring the cathodic current at said metallic body; and

while said body is protected by said cathodic protection system, evaluating the measured metallic body cathodic current to afford monitoring of the cathodic protection being provided to the structure.

4,639,678

ABSOLUTE CHARGE DIFFERENCE DETECTION METHOD AND STRUCTURE FOR A CHARGE COUPLED DEVICE

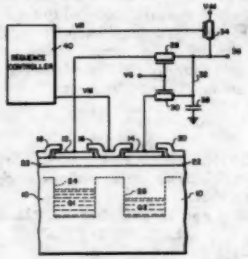
Eugene S. Schlig, Somers, N.Y., and Savvas G. Chamberlain, Waterloo, Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,220

Int. Cl.⁴ G01R *29/24, 29/12*; H01L *29/78*; G11C *19/28*

U.S. Cl. 324—457 **5 Claims**

1. A method for determining the absolute value of the difference between two charge packets in a charge coupled device including a semiconductor substrate having overlying electrodes comprising placing the charge packets in separate potential wells in the semiconductor substrate of the charge coupled device separated by a potential barrier, merging the charge packets by removing the barrier, and integrating the electrical signals induced into the overlying electrodes of the charge coupled device by the merger of the charge packets as a measure of the original absolute difference between the two charge packets, the same first level potential being applied to the two electrodes overlying the separate potential wells to maintain wells of equal depth, while maintaining an intermediate electrode at a second potential level to maintain the potential barrier between the potential wells, the barrier being removed by changing the potential on the intermediate electrode to cause the charge packets to merge and the potentials under all three electrodes to equalize, changing the potential of the intermediate electrode to restore the potential barrier, and integrating a current induced by the merging of the charge packets through the one of the two overlying electrodes originally having the lesser charge packet as a measure of the original absolute difference between the two charge packets.



4,639,679

FREQUENCY-DOUBLING CIRCUIT

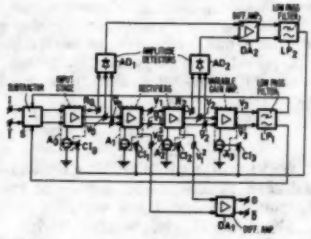
Wolfdietrich G. Kasperkovitz, and Herman W. Van Rumpt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 13, 1984, Ser. No. 671,151

Claims priority, application Netherlands, Nov. 10, 1983, 8303855

Int. Cl.⁴ H03K *1/16*

U.S. Cl. 328—20 **7 Claims**



1. In a frequency-doubling circuit for doubling the fundamental frequency of a signal wave, such circuit comprising first and second full-wave rectifier circuits to which the signal wave is applied in mutual phase-quadrature and having outputs at which they produce rectified signals which are subtracted from each other to obtain the second harmonic of the fundamental frequency of the signal wave, the improvement characterized in that:

said first full-wave rectifier circuit comprises a first variable-gain amplifier having an input to which the signal wave is applied and an output which is capacitively loaded to produce a 90°-phase shift at the fundamental frequency, said first variable-gain amplifier further having a control

input for controlling the gain factor thereof, the output of said first variable-gain amplifier being coupled to the input of said second full-wave rectifier circuit;

said frequency-doubling circuit further comprises:

first and second amplitude detectors each having inputs and an output, an input of the first amplitude detector being coupled to the input of the first variable-gain amplifier and an input of the second amplitude detector being coupled to the output of the second full-wave rectifier circuit; and

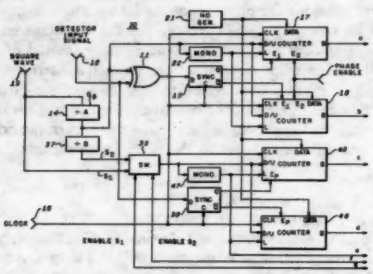
a first differential amplifier having inputs respectively coupled to the outputs of the first and second amplitude detectors and having an output coupled to the control input of the first variable-gain amplifier for supplying a negative feedback control signal thereto which adaptively maintains the gain factor of the first variable-gain amplifier at unity at said fundamental frequency.

4,639,680

DIGITAL PHASE AND FREQUENCY DETECTOR

Alec L. Nelson, Scottsdale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,624
Int. Cl.[4] H03D *13/00*
U.S. Cl. 328—134 **6 Claims**



1. A digital signal detector comprising:

means for providing a reference signal at a frequency f_1 and phase p_1;

means for providing an input signal representative of a signal at a frequency f_2 and phase p_2;

means for providing clock pulses;

count means responsive to said reference signals, said input signals, and said clock pulses for counting said clock pulses when p_1 differs from p_2 and when f_1 differs from f_2, and for providing output signals indicating phase and frequency differences when clock pulse counts exceed preselected count values.

4,639,681

WAVEFORM RESHAPING CIRCUIT

Tsunao Hasegawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

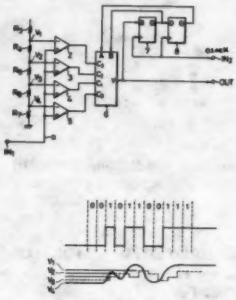
Filed Feb. 21, 1985, Ser. No. 703,966
Claims priority, application Japan, Feb. 22, 1984, 59-32239
Int. Cl.[4] H03K *5/08*
U.S. Cl. 328—164 **3 Claims**

1. A waveform reshaping circuit for a distorted digital input signal whose instantaneous level varies according to binary data, comprising:

a plurality of comparison means for comparing an instantaneous level of said digital signal with a plurality of reference levels to provide outputs, respectively; and

selecting means for selecting one of said outputs as a digital signal which is waveform shaped selectively according to binary data in said digital signal which has been outputted; and

wherein said selecting means comprises: a multiplexer having data inputs receiving respective ones of said outputs of said comparison means; and shift register means having a clock input, a data input coupled to an output of said multiplexer, and logic coded clocked outputs coupled to control inputs of said multiplexer, so that said multiplexer



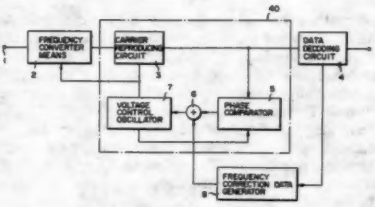
selects an instantaneous reference level from said outputs of said plurality of comparison means according to said binary data in said distorted digital input signal, whereby a reshaped undistorted digital output is provided in synchronism with said clock.

4,639,682

CARRIER REPRODUCING CIRCUIT FOR PHASE SHIFT KEYING SIGNALS

Seiji Takeuchi, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 2, 1985, Ser. No. 751,236
Claims priority, application Japan, Jul. 10, 1984, 59-141472
Int. Cl.[4] H03D *3/02*
U.S. Cl. 329—50 **5 Claims**



1. A carrier reproducing circuit for signals transmitted in carrier suppressed modulation comprising:

frequency converting means for converting said transmission signal to a frequency of a carrier to be reproduced;

demodulator means, coupled to said frequency converting means, for demodulating transmission data, said demodulator means including carrier reproducing means for producing said carrier, voltage controlled oscillator means, coupled to said carrier reproducing means, for generating an oscillation output and for supplying said oscillation output to said carrier reproducing means, and phase comparing means, coupled to said carrier reproducing means and said voltage controlled oscillator means, for comparing the phase of said reproduced carrier and said oscillation output and for generating a control voltage, said voltage controlled oscillator means being controlled by said control voltage;

error detecting means coupled to said demodulator means for detecting the bit error rate of said demodulated data; and

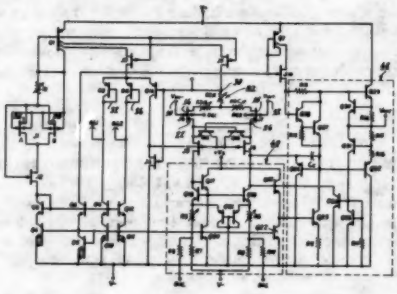
frequency correction data generator means coupled to said error detecting means for generating a correction voltage in accordance with said detected bit error rate, said frequency correction data generator being coupled to said voltage controlled oscillator means so as to superimpose said correction voltage onto said control voltage.

4,639,683

VERY LOW INPUT CURRENT JFET AMPLIFIER

Lewis W. Counts, Lexington, and JoAnn P. Close, Arlington, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Filed Feb. 7, 1986, Ser. No. 827,236
Int. Cl.[4] H03F 3/45
U.S. Cl. 330—253 **21 Claims**



1. An IC chip including a low-input-current differential amplifier comprising:

a pair of low-leakage-current JFETs having their top and back gates electrically isolated in the transistor structures;

a pair of input terminals connected respectively to the top gates of said JFETs to supply thereto a differential input signal to be amplified;

a supply voltage circuit having first and second terminals;

first circuit means connecting said first supply voltage terminal to the source electrodes of said JFETs to furnish operating current thereto;

second circuit means connecting said second supply voltage terminal to the drain electrodes of said JFETs;

bias means connected to said source electrodes and including a bias terminal establishing a predetermined bias potential with respect to said source electrodes; and

third circuit means coupling said bias terminal to the back gates of said JFETs.

4,639,684

DIFFERENTIAL INPUT STAGE FOR THE REALIZATION OF LOW NOISE AND HIGH PRECISION BIPOLAR TRANSISTOR AMPLIFIERS

David P. Laude, Colorado Springs, Colo., assignor to Harris Corporation, Melbourne, Fla.

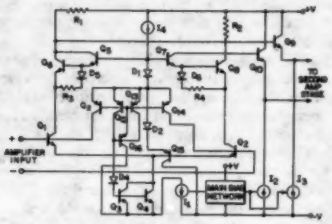
Filed Nov. 6, 1984, Ser. No. 668,864
Int. Cl.[4] H03F 3/45
U.S. Cl. 330—259 **37 Claims**

1. A differential amplifier stage, comprising:

a differential transistor pair, each transitor having a first and second terminal and a control terminal, each of said first terminals being connected to a first reference potential, each of said control terminals being connected to respective stage inputs, and each of said second terminals being connected together at a common node;

biasing means for causing a biasing current to flow from said common node to a second reference potential;

sensing means serially connected to said biasing means between said common node and said second reference potential for sensing said biasing current; and



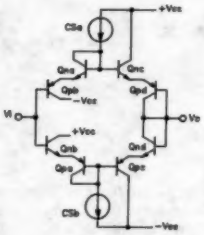
feedback means, interconnecting said sensing means and said stage inputs, for supplying current to the control terminals of the differential transistor pair as a function of said sensed biasing current.

4,639,685

OFFSET REDUCTION IN UNITY GAIN BUFFER AMPLIFIERS

Kenneth R. Saller, Ft. Collins, and Kurt R. Rentel, Loveland, both of Colo., assignors to Comlinear Corporation, Fort Collins, Colo.

Filed Jul. 18, 1985, Ser. No. 756,750
Int. Cl.[4] H03F 3/26, 3/45
U.S. Cl. 330—263 **4 Claims**



1. A unity gain buffer amplifier, the amplifier comprising:

first PNP transistor means having base, emitter, and collector electrodes, the collector electrode of which is connected to a source of negative supply voltage;

first NPN transistor means having base, emitter, and collector electrodes, the collector electrode of which is connected to a source of positive supply voltage, and the base electrode of which is connected to the base electrode of said first PNP transistor means and for receiving an input signal;

second PNP transistor means having base, emitter, and collector electrodes, the emitter electrode of which is connected to the emitter electrode of said first NPN transistor means and the base and collector electrodes of which are connected together and, through a first current source, to said source of negative supply voltage;

second NPN transistor means having base, emitter, and collector electrodes, the emitter electrode of which is connected to the emitter electrode of said first PNP transistor means and the base and collector electrodes of which are connected together and, through a second current source, to said source of positive supply voltage;

third PNP transistor means having base, emitter, and collector electrodes, the base electrode of which is connected to the base electrode of said second PNP transistor means

and the collector electrode of which is connected to said source of negative supply voltage;

third NPN transistor means having base, emitter, and collector electrodes, the base electrode of which is connected to the base electrode of said second NPN transistor means and the collector electrode of which is connected to said source of positive supply voltage;

fourth PNP transistor means having base, emitter, and collector electrodes, the emitter electrode of which is connected to the emitter electrode of said third NPN transistor means and the base and collector electrodes of which are connected together; and

fourth NPN transistor means having base, emitter, and collector electrodes, the emitter electrode of which is connected to the emitter electrode of said third PNP transistor means and the base and collector electrodes of which are connected together and to the base and collector electrodes of said fourth PNP transistor means to provide an output of said unity gain buffer amplifier.

4,639,686

HIGH FREQUENCY AMPLIFIER CIRCUIT

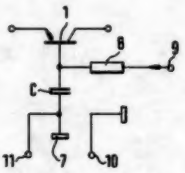
Walter Beckenbach, and Heinz Rinderle, both of Heilbronn, Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,619

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3326957

Int. Cl.[4] H03F *3/195*

U.S. Cl. 330—307 **9 Claims**



1. A high frequency amplifier circuit comprising: a passive tuned input circuit; a passive tuned output circuit; and a single amplifier transistor, for amplifying an input signal at a given operating frequency, integrated into a semiconductor substrate and connected in a common base configuration with its emitter zone directly connected to said input circuit to receive the input signal to be amplified, its collector zone connected to said output circuit, and its base zone connected to said semiconductor substrate via an integrated capacitance of a value which short circuits said base of said amplifying transistor to said substrate at the operating frequency of said amplifier circuit.

4,639,687

PHASE CONTROL CIRCUIT

Werner Scholz, Gehrden, Fed. Rep. of Germany, assignor to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

PCT No. PCT/EP84/00381, § 371 Date Aug. 12, 1985, § 102(e) Date Aug. 12, 1985, PCT Pub. No. WO85/02731, PCT Pub. Date Jun. 20, 1985

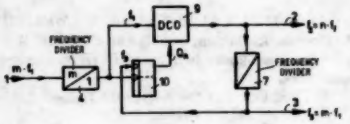
PCT Filed Dec. 1, 1984, Ser. No. 767,198

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345142

Int. Cl.[4] H03L *7/08*

U.S. Cl. 331—1 A **8 Claims**

1. A phase control circuit comprising: a frequency controllable oscillator means which is controllable by a correction signal to produce, from an input signal having an input frequency, an output signal which has selected nominal frequency and phase relations to the input frequency; and a phase comparator stage operative for generating the correction signal and connected to said oscillator means for controlling said oscillator means as a function of the correction signal, wherein the correction signal is a digital signal and said oscillator means comprise circuit means operative for causing the frequency of



the output signal to selectively vary between a first frequency value which is on average slightly below the frequency value corresponding to the nominal frequency relation and a second frequency value which is on average slightly above the frequency value corresponding to the selected nominal frequency relation.

4,639,688

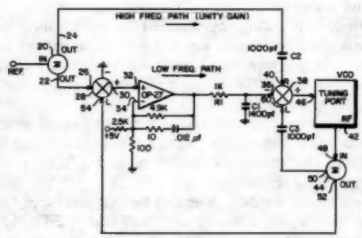
WIDE-BAND PHASE LOCKED LOOP AMPLIFIER APPARATUS

Francis W. Hopwood, Severna Park; Stephen P. Caldwell, Linthicum, and Martin J. Decker, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 18, 1985, Ser. No. 724,714

Int. Cl.[4] H03L *7/00*

U.S. Cl. 331—10 **7 Claims**



1. A wide-band phase locked loop amplifier apparatus comprising in combination:

a first summing means to receive an RF reference signal, said first summing means having a first and second output port,

a first mixer means having a first input port to receive said RF reference signal from said second output port of said first summing means, said first mixer means having a second input port and a first and second output port, said first output port connected to ground,

an amplifier means connected to said second output port of said first mixer means to receive the first composite signal therefrom at its noninverting input terminal, said amplifier means having an inverting terminal and an output terminal,

a filter means connected to said output terminal of said amplifier means to receive the output signal therefrom, said filter means filtering said output signal,

a second mixer means receiving said output signal from said filter means at its first input port, said second mixer means having a second input port, a third input port and an output port, said second input port of said second mixer means receiving said RF reference signal from said first output port of said first summing means, said second mixer

means providing a second composite signal at said output port,

a voltage controlled oscillator means receiving said second composite signal at its tuning port, said voltage controlled oscillator means providing an RF signal at its output port, and,

a second summing means receiving said RF signal from said voltage controlled oscillator at a first input port, said second summing means having a first and second output port, said second summing means applying said RF signal through said second output port to said third input port of said second mixer means such that said second mixer means combines all received input signals to form said second composite signal, said second summing means applying said RF signal through said third output port to said second input port of said first mixer means such that the received signals are combined to form said first composite signal.

4,639,689

INDUCTIVE LOOP DETECTOR

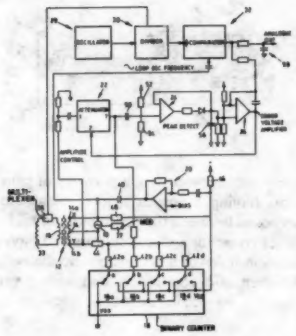
David W. Bartlett, Natal, South Africa, assignor to E M X International Limited, United Kingdom

Filed Aug. 27, 1985, Ser. No. 769,868

Claims priority, application United Kingdom, Sep. 4, 1984, 8422277

Int. Cl.[4] G01N *27/00*; G08G *1/01*

U.S. Cl. 331—65 **16 Claims**



1. A method of controlling the frequency of oscillation of an inductive loop which is excited in response to at least a first signal which includes the steps of deriving a second signal with an amplitude which is dependent on the amplitude of the first signal, deriving an intermediate signal which is in antiphase to the first signal, deriving a third signal with an amplitude which is dependent at least on the amplitude of the intermediate signal, combining the third signal with the second signal to produce a fourth signal, and further exciting the loop in response to the fourth signal thereby to vary the frequency of oscillation of the loop.

4,639,690

TUNABLE, DIELECTRIC-RESONATOR-STABILIZED OSCILLATOR AND METHOD OF TUNING SAME

Gary K. Lewis, Upper Marlboro, Md., assignor to Litton Systems, Inc.

Filed Jul. 5, 1985, Ser. No. 752,297

Int. Cl.[4] H03B *5/18*; H01P *7/10*

U.S. Cl. 331—96 **17 Claims**

1. A tunable, frequency-stabilized oscillator, comprising:

a negative resistance oscillator circuit having at least one active element; and

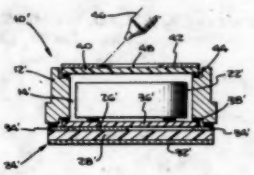
at least one dielectric resonator connected in said oscillator circuit having at least one electrically-conductive area on its surface, the selective variation in size of which alters the resonant frequency of said at least one resonator;

said at least one dielectric resonator further comprising:

a. an electrically conductive resonator housing having a resonating cavity therethrough;

b. a resonator body made of dielectric medium;

c. a resonator body mounting plate of thin, rigid dielectric



material mounted at one end of said cavity in said housing to mount said resonator body within said cavity; and

d. a tuning plate of thin, rigid dielectric material mounted at the other end of said cavity from said first-mentioned plate, coated with an electrically conductive material whose areal extent over said plate may be selectively varied, whereby the resonant frequency of said dielectric resonator may be finely tuned.

4,639,691

OSCILLATOR

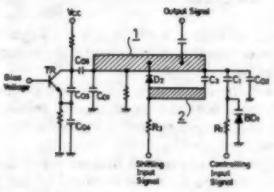
Kouta Iigima, Souma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Oct. 4, 1985, Ser. No. 784,339

Claims priority, application Japan, Oct. 4, 1984, 59-150397[U]

Int. Cl.[4] H03B *5/18, 7/12*

U.S. Cl. 331—99 **2 Claims**



1. An oscillator comprising:

a microstrip line acting as a resonance line having an input terminal for receiving an input signal and an output terminal for providing an output signal of a selected oscillation frequency in response to said input signal;

a frequency controlling variable capacitor having one end connected to said input terminal of said micro-strip line for providing said input signal to said micro-strip line in accordance with a controlling voltage signal applied to its other end;

an auxiliary micro-strip line having one terminal connected with said input terminal of said micro-strip line and another terminal thereof being connectable to a part of said micro-strip line, said auxiliary micro-strip line providing a capacitance to said input terminal of said micro-strip line when its other terminal is not connected thereto such that the oscillation frequency of the output signal is at one level, and said auxiliary micro-strip line acting to decrease the line impedance of said micro-strip line when its other terminal is connected with said part of said micro-strip line such that the oscillation frequency of the output signal is increased to another level; and

a switch for connecting and disconnecting said other termi-

nal of said auxiliary micro-strip line with and from said part of said micro-strip line so that the oscillation frequency of the oscillator may be switched between said one or the other levels.

4,639,692

INTEGRATABLE SQUAREWAVE PULSE OSCILLATOR

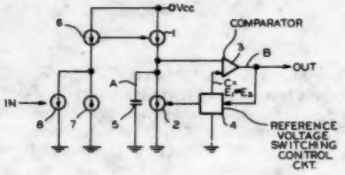
Takahisa Kitaguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

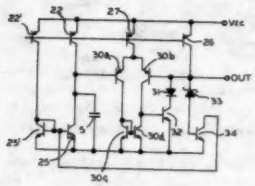
Filed Jun. 6, 1985, Ser. No. 742,052

Claims priority, application Japan, Jun. 11, 1984, 59-119395

Int. Cl.⁴ H03K 3/26

U.S. Cl. 331—111 **6 Claims**





1. An oscillator circuit comprising:

a capacitor;

a charge current source for charging the capacitor;

a discharge constant current circuit for discharging said capacitor;

a comparator for comparing the voltage of said capacitor when charged with a first or second reference voltage, said first and second reference voltages being upper and lower level voltages;

said comparator comprising a first transistor having a base electrode connected to one terminal of the capacitor, a second transistor having a base electrode connected to the output terminal of the oscillator circuit and having an emitter electrode connected to an emitter electrode of the first transistor, two additional transistors having base electrodes connected to each other in a current mirror coupling, a collector of one of the additional transistors being connected to a base electrode of the other of the additional transistors and to a collector electrode of the first transistor, a collector electrode of the other of the additional transistors being connected to a collector electrode of the second transistor;

a reference voltage switching control circuit for supplying to said comparator the first or second reference voltage in response to the output of said comparator, said reference voltages switching control means alternately and cyclically supplying the two reference voltages to cause said comparator to have an oscillating output, the supplied reference voltage controlling the turning on and off of said discharge constant current circuit whereby the oscillating frequency at the output of said comparator is determined by the charging and discharging current supplied to said capacitor;

said switching control means comprising a third transistor having a base electrode connected to the collector of the other of the additional transistors, a diode connected between the output of the oscillator circuit and a collector of the third transistor, a fourth transistor having a collector electrode connected to the discharge constant current circuit, a Zener diode connected between the output of the oscillator circuit and a base electrode of the fourth transistor, emitters electrodes of the third and fourth transistors being grounded; and

a control constant current source for controlling the current from said charge current source;

wherein the output signal frequency of said comparator is controlled by regulating said control constant current source to switch the current capacity of said charge current source.

4,639,693

STRIP LINE CABLE COMPRISED OF CONDUCTOR PAIRS WHICH ARE SURROUNDED BY POROUS DIELECTRIC

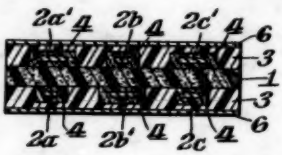
Hirosuke Suzuki, Tokorozawa; Hiromi Yasumoto, and Hiroshi Umemoto, both of Umahikizawa Hitaka, all of Japan, assignors to Junkosha Company, Ltd., Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,540

Claims priority, application Japan, Apr. 20, 1984, 59-58184[U]

Int. Cl.⁴ H01P 3/08

U.S. Cl. 333—1 **4 Claims**



1. A strip line cable comprising a plurality of pairs of electrical conductors having a porous strip of dielectric insulation material interposed between the conductors of said pairs, and a covering jacket covering said conductors and having, in addition, an insulation layer of a porous plastic dielectric material provided between said conductors and said covering jacket such that porous dielectric surrounds each individual said conductor.

4,639,694

POWER DISTRIBUTION CIRCUIT HAVING CENTER PORTIONS OF ISOLATION RESISTORS CONNECTED TOGETHER

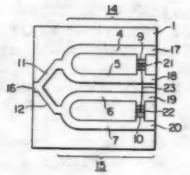
Kiyoharu Seino; Tadashi Takagi, and Fumio Takeda, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 23, 1985, Ser. No. 726,322

Claims priority, application Japan, Apr. 27, 1984, 59-85833

Int. Cl.⁴ H01P 5/12

U.S. Cl. 333—128 **3 Claims**



1. A power distribution circuit for splitting a signal at an

input terminal into four output signals at four output terminals comprising:

a substrate,

a first and second Wilkinson-type parallel bi-distribution circuit formed of a microstrip on said substrate,

said first bi-distribution circuit including a first pair of planar conducting elements on said substrate extending between an input end and a first pair of said output teminals, means connecting the input end of said elements of said first bi-distribution circuit together and to said input terminal of said power distribution circuit, a first isolation resistor formed on said substrate shunting longitudinally between said first pair of output terminals,

said second bi-distribution circuit including a second pair of planar conducting elements on said substrate extending between an input end and a second pair of said output terminals, means connecting the input end of said elements of said second bi-distribution circuit together and to said input terminal of said power distribution circuit, a second isolation resistor formed on said substrate shunting longitudinally between said second pair of output terminals, and

said power distribution circuit including a metallic thin wire spaced from said substrate and connecting the longitudinal center portions of said first and second isolation resistors together.

4,639,695

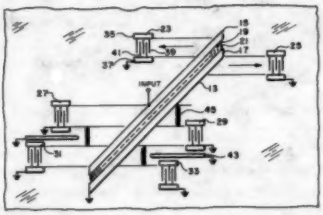
WIDEBAND SAW CHANNELLIZER USING SLANTED ARRAY INPUT TRANSDUCER

Elio A. Mariani, Hamilton Square, and William J. Skudera, Jr., Eatontown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 25, 1985, Ser. No. 749,038

Int. Cl.[4] H03H *9/72*

U.S. Cl. 333—133 **8 Claims**



1. Apparatus for frequency-partitioning and channelizing a wideband RF spectrum surface acoustic wave signal into a multiplicity of narrow band contiguous acoustic output signals, comprising, in combination:

a surface wave conductive base;

an input transducer on said base aslant the direction of reception signal propagation:

a first multiplicity of output transducers on said base arranged in spaced-apart relationship along a first longitudinally extending side of said input transducer and spaced therefrom;

a second multiplicity of output transducers on said base arranged in spaced relationship along a second longitudinally extending side of said input transducer, one each of said second multiplicity of output transducers disposed opposite a space between the output transducers in said first multiplicity of output transducers, and spaced therefrom.

4,639,696

DELAY LINE

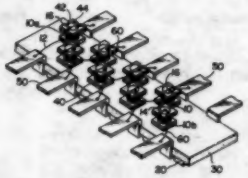
Kiyobumi Murata, Saitama, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Nov. 5, 1985, Ser. No. 795,174

Claims priority, application Japan, Nov. 6, 1984, 59-168411[U]

Int. Cl.[4] H03H *7/32*

U.S. Cl. 333—138 **6 Claims**



1. A lumped constant type delay line device, comprising:

a base plate formed of a insulating material;

a plurality of terminals securely attached to said base plate;

a plurality of cores each having a coil wound thereon and each having a top surface, each of said coils being provided with a tap; and

a plurality of planar electrodes respectively intimately adhering to the top surfaces of said cores, said taps being connected to said electrodes respectively.

4,639,697

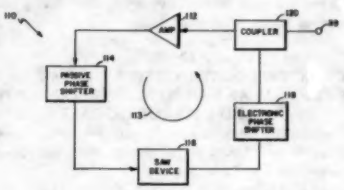
TEMPERATURE COMPENSATION CIRCUITRY

Arthur Yarranton, Maynard; Charles E. Chase, Jr., Needham, and Jean E. Picquendar, Wareham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 13, 1984, Ser. No. 650,019

Int. Cl.[4] H03H *9/42, 9/68;* H03B *5/32*

U.S. Cl. 333—155 **47 Claims**



11. In combination:

a surface acoustic wave device to provide in response to an input signal, an output signal having a first predetermined phase shift and a first predetermined phase shift variation as a function of temperature with respect to the input signal; and

means, disposed to have at least one of said input and output signals coupled therethrough, said means including a passive component having an electrical characteristic which varies as a function of the temperature of the component, for providing a second temperature dependent predetermined phase shift variation to reduce the temperature dependent phase shift variation of said output signal.

4,639,698

CERAMIC ELECTRONIC FILTER

Masahiro Nishiki, Aichi, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jan. 21, 1986, Ser. No. 820,094

Claims priority, application Japan, Jan. 21, 1985, 60-6966[U]

Int. Cl.[4] H03H *9/10, 9/60, 9/52*

U.S. Cl. 333—187 **15 Claims**

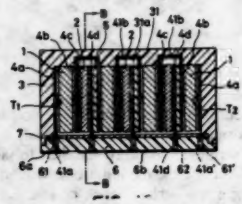
1. A filter assembly comprising:

at least two planar piezoelectric resonator elements, each element having opposed nodal points in the planar surfaces thereof;

inputting, outputting, and grounding planar terminal boards operatively, electrically and mechanically connected to said resonator elements at said nodal points, said planar resonator elements and said planar terminal boards being positioned in parallel relationship to one another;

a plurality of terminal legs, one of said legs extending from an edge of each of said planar terminal boards in a direction essentially parallel to the plane of the respective board;

an insulating case open on one side, said resonator elements and said terminal boards being housed in said case, said



terminal boards being positioned in said case with each of said terminal legs protruding from the open case side;

an insulating lid for closing said case, said lid having holes positioned and configured for receiving said protruding terminal legs; and

conductive means disposed in a predetermined pattern on the outer surface of said insulating lid for electrically connecting said received terminal legs,

wherein said at least two resonator elements are electrically connected in series, the filter assembly further including at least two series terminal boards housed in said insulating case and a bridge element for electrically interconnecting said two resonator elements, and wherein a wall of said insulating case has a recess to receive said bridge element.

4,639,699

DIELECTRIC RESONATOR COMPRISING A RESONANT DIELECTRIC PILLAR MOUNTED IN A CONDUCTIVELY COATED DIELECTRIC CASE

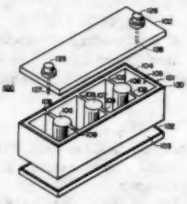
Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa, Kyoto, and Hidekazu Wada, Kobe, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 30, 1983, Ser. No. 537,711

Claims priority, application Japan, Oct. 1, 1982, 57-173713; Oct. 4, 1982, 57-175458; Oct. 4, 1982, 57-151615[U]; Oct. 5, 1982, 57-151578[U]; Oct. 7, 1982, 57-176707; Oct. 7, 1982, 57-152415[U]; Oct. 18, 1982, 57-183170; Nov. 12, 1982, 57-171900[U]; Dec. 6, 1982, 57-185090[U]; Feb. 1, 1983, 58-14075[U]; Feb. 1, 1983, 58-14076[U]

Int. Cl.[4] H01P *7/10*

U.S. Cl. 333—202 **39 Claims**



38. A dielectric resonator for electromagnetic waves at a resonant frequency, comprising:

a case comprised of dielectric material having surfaces which define an interior region bounded by said case, a conductive film located on and extending over said dielectric material, said conductive film substantially enclosing said region, said dielectric material of said case having a given coefficient of linear expansion; and

a first element having a body comprised of dielectric material and located in said region, said dielectric material of said first element having said above-mentioned given coefficient of linear expansion, said case comprising a piece formed of said dielectric material, said piece being integral with said first element, said dielectric resonator further comprising second and third elements located in said region, each comprising dielectric material and being integrally formed with said piece of said case, the respective dielectric materials of said second and third elements each having said above-mentioned given coefficient of linear expansion, both said case and said elements having the same said given coefficient of linear expansion for stabilizing said resonant frequency of electromagnetic waves in said region.

4,639,700

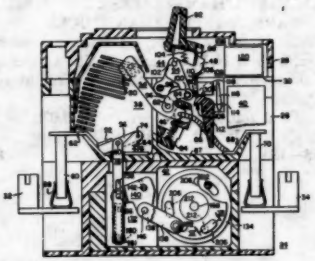
CIRCUIT INTERRUPTER WITH SHOCK RESISTANT MECHANISM

Edward J. Shestak, Penn Hills Township, Allegheny County, and David Marschik, Wilkens Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1986, Ser. No. 831,034

Int. Cl.[4] H01H *77/00*

U.S. Cl. 335—6 **8 Claims**



1. A circuit interrupter with shock-resistant mechanism, comprising:

an electrically insulating housing;

a circuit breaker having first and second separable contacts operable between open and closed positions;

the circuit breaker including a trip mechanism having a releasable lever movable when released to a tripped position to cause automatic opening of the contacts;

the first contact being mounted on a first arm coupled to the releasable lever;

the second contact being mounted on a second arm of which at least a portion is substantially parallel to the first arm to cause current limiting repulsion of the contacts in response to a predetermined overcurrent condition;

electromagnetic actuating means connected to the second arm for moving the second contact between open and closed positions relative to the first contact;

the electromagnetic actuating means comprising a pair of solenoids, each solenoid having a coil and an armature contained within a case including an apertured end wall and the armature extending through the end wall and the armatures being in substantial alignment,

each armature having an armature plate integral with the end of the armature and external of the end wall,

rotary means between each armature plate and end wall for rotating the armature plate when the armature moves

longitudinally in response to operation of the armature coil;

the armature plates being oppositely disposed and having a common connection forming an assembly of the plates which is rotatable in tandem between first and second positions corresponding to the closed and open positions of the separable contacts;

linkage means between the armature plates and the second contact arm and including a coupler link pivotally connected at one end to a common connection between the armature plates for movement with the plates; and

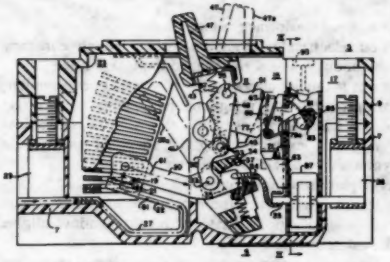
the longitudinal axis of the coupler link being in alignment with a line extending through the common connection and the rotational axis of the plates when the plates are in the first position so as to resist opening of the contacts when the circuit interrupter is subjected to vibrational shock waves.

4,639,701

CIRCUIT BREAKER WITH INTERFACE FLUX SHUNT TRIP

Alan B. Shimp, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 30, 1985, Ser. No. 771,377
Int. Cl.[4] H01H *73/02, 75/00, 77/00*
U.S. Cl. 335—21 **4 Claims**



1. A circuit breaker comprising:

a housing;

a circuit breaker structure supported in the housing;

the circuit breaker structure having a pair of contacts operable to open and close an electric circuit;

a releasable mechanism;

manually operable means manually operable when the releasable mechanism is in a latched position to open and close the contacts;

trip means including an electro-mechanical means operable automatically in response to overload current conditions above a predetermined value to release the releasable mechanism whereupon the releasable mechanism automatically moves from the latched position to a tripped position to open the contacts;

the manually operable means being operable to move the releasable mechanism from the tripped position to the latched position after release of the releasable mechanism;

latch means including a latch lever operable between latching and unlatching positions to latch the releasable mechanism;

the trip means also including a trip bar rotatably mounted on its longitudinal axis between latching and unlatching positions in response to operation of the electro-mechanical means for unlatching the latch lever and being biased in the untripped position; and

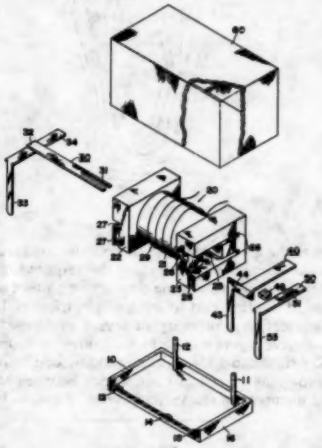
the electro-mechanical means being operable against a surface of the trip bar to rotate the bar to the tripped position and including a second lever movable by the electromechanical means against a surface of the trip bar to unlatch the latch lever.

4,639,702

REED RELAY

Ryuichi Sato, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 9, 1985, Ser. No. 785,825
Claims priority, application Japan, Oct. 9, 1984, 59-152920[U]
Int. Cl.[4] H01H *1/66, 51/00*
U.S. Cl. 335—153 **6 Claims**



1. A reed relay comprising:

(a) a pair of fixed contact supports mounted at a first end of said relay each having a fixed contact thereon and arranged at a regular spacing therebetween;

(b) a reed strip having a fixed end mounted at a second end of said relay being opposed to said first end and a movable contact at a free end thereof and arranged so that said movable contact is positioned between said pair of fixed contacts, said movable contact also having a pair of sides;

(c) a coil wound around said reed strip; and

(d) a permanent magnet disposed in contact with one of said fixed contact supports and on one of said sides of the movable contact of said reed strip and being spaced apart therefrom to allow an unobstructed viewing space to remain at the first end of the relay, allowing viewing of the free end of said reed strip.

4,639,703

SADDLE COILS FOR ELECTROMAGNETIC DEFLECTION UNITS

John G. Metcalfe, York, England, assignor to U.S. Philips Corporation, New York, N.Y.

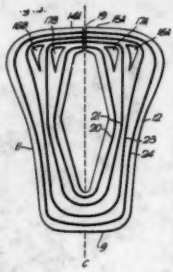
Filed May 22, 1985, Ser. No. 736,909
Int. Cl.[4] H01F *5/02*
U.S. Cl. 335—213 **35 Claims**

1. A method of forming a saddle coil for a deflection coil assembly which in use deflects the electron beam or beams of a cathode ray display tube in one of two orthogonal directions, the saddle coil comprising conductive patterns on assembled layers of insulating film parts, said method comprising the steps of:

(i) producing for each of said layers a first substantially 'U' shaped lamelliform part and a second lamelliform part from insulating film with patterns of conductive members on each part, the width of each part at any point being

marginally greater than the width of the conductive pattern thereon at that point,

(ii) assembling the first part with the second part to form a layer by distorting the shape of the first part such that it is flared and bridging the distal ends of the first part with the second part so that the flared side limbs of the first part form the side members of the layer for the saddle coil with the transverse limb of the first part forming the gun end whilst the second parts forms at least part of the screen



end of the layer for the saddle coil, the conductive pattern on the second part providing the required interconnections between ends of the conductive pattern at the distal ends of the first part to form an electrical coil,

(iii) assembling a plurality of layers so formed such that successive layers adhere to each other to form a substantially rigid and self-supporting saddle coil, and

(iv) providing electrical connections between the conductive members of the various layers of said saddle coil.

4,639,704

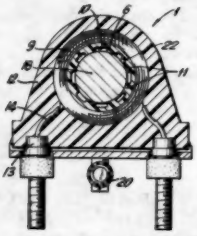
DEBRIS TOLERANT SOLENOID

J. Richard Shand, Middlebury, and Raymond H. LaChance, Canaan, both of Conn., assignors to Bicron Electronics Company, Canaan, Conn.

Filed Mar. 3, 1986, Ser. No. 835,684

Int. Cl.[4] H01F *7/08*

U.S. Cl. 335—255 **6 Claims**



1. In a solenoid adapted to be immersed in a fluid containing magnetic contaminants, said solenoid including a frame having two longitudinally spaced ends, a bobbin of non-magnetic material disposed between said frame ends, said bobbin having a central longitudinal passage, an electromagnetic coil wound on said bobbin, a magnetic more piece attached to one of said frame ends and extending partially through the bobbin central longitudinal passage, and an armature extending through the other frame end and movable within said bobbin central longitudinal passage to and from the core piece and defining a variable volume fluid chamber between the armature and core piece, the improvement comprising:

a plurality of longitudinal, circumferentially spaced flutes in the bobbin central passage defining a plurality of longitudinal passages open at either end of the bobbin, said passages communicating with said variable volume fluid chanber defined between the armature and the core piece, whereby energization of said coil moves said armature toward said core to reduce the volume of said chamber and expel fluid from said chamber and through said longitudinal passages to prevent entry of magnetic contaminants.

4,639,705

TRANSFORMER WITH GAPLESS CORE ON SUPPORT

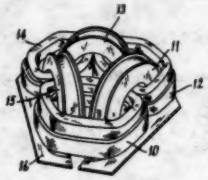
Jean-Claude Beisser, Pierre Grise, La Chaux-de-Fonds, Switzerland (CH-2300)

Filed Feb. 27, 1985, Ser. No. 706,296

Claims priority, application France, Mar. 6, 1984, 84 03463

Int. Cl.[4] H01F *33/02, 27/26, 27/30*

U.S. Cl. 336—5 **10 Claims**



1. An electric transformer comprising:

at least one electrical winding made of a conductive material wound about a wheel rim-shaped annular former;

at least one magnetic circuit made of at least one elementary circuit provided by coiling a magnetic metal strip of constant width into a gapless core with a window, said at least one magnetic circuit having the shape of an irregular polygon with an axis of symmetry;

a support plate having a recess;

said at least one magnetic circuit being positioned and maintained on said support plate with said window aligned with said recess; and

said at least one winding extending through said recess and said window and surrounding said plate and said at least one magnetic circuit.

4,639,706

FLYBACK TRANSFORMER

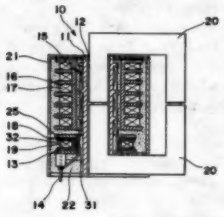
Yohei Shimizu, Nishinomiya, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 4, 1985, Ser. No. 784,440

Claims priority, application Japan, Oct. 30, 1984, 59-164020[U]

Int. Cl.[4] H01F *27/30*

U.S. Cl. 336—170 **3 Claims**



1. A flyback transformer which comprises:

a low tension coil bobbin including a hollow cylindrical

portion surrounded by a primary coil winding having terminal ends, a terminal board provided with a plurality of legs supporting connecting terminals, and a flange portion axially spaced a predetermined distance from said terminal board and forming a substantially cylindrical compartment portion below said hollow cylindrical portion, said low tension coil bobbin further including a plurality of first passage means formed axially in said cylindrical compartment portion leading said primary coil winding terminal ends from said hollow cylindrical portion through said cylindrical compartment portion to said connecting terminals;

a high tension coil bobbin concentrically disposed at an outer peripheral portion of said hollow cylindrical portion of said low tension coil, bobbin extending a predetermined distance along said hollow cylindrical portion and being wound with a secondary coil around an outer portion thereof; and

an auxiliary coil bobbin composed of insulating material, including a pair of semi-annular frame members of U-shaped cross section fitted into said cylindrical compartment portion of said low tension coil bobbin and joined together so as to define an annular groove in which a tertiary coil is wound, said tertiary coil being electrically separated from said terminal ends of said primary coil winding passing through said first passage means by said auxiliary coil bobbin, said auxiliary coil bobbin being formed with a plurality of second passage means guiding terminal ends of said tertiary coil winding to said connecting terminals.

4,639,707

TRANSFORMER WITH TOROIDAL MAGNETIC CORE

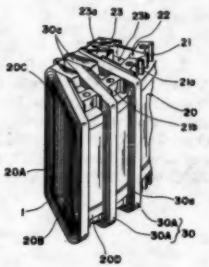
Kazuhiro Tanaka, Suita; Yasuo Yamamoto, Settsu; Katsumi Hanaoka, Kawanishi, and Masatake Hirai, Kyoto, all of Japan, assignors to Allied Corporation, New York, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,164

Claims priority, application Japan, Mar. 20, 1985, 60-39026[U]

Int. Cl.⁴ H01F *27/30*

U.S. Cl. 336—185 **4 Claims**



1. A transformer with a toroidal magnetic core which comprises:

a toroidal magnetic core;

an annular winding frame for covering the top and bottom surfaces of the toroidal magnetic core in its axial direction thereof on which a plurality of grooves for inserting a winding conductor are formed radially;

a winding of the transformer being consisted of a plurality of unit coils being connected between the adjacent two of them electrically, where the unit coils are wound around the core, fixed in the groove of the annular winding frame;

conductor guiding grooves each being laid between two grooves for inserting a winding conductor adjacent to each other, said conductor guiding groove having a shallow groove portion near the end on the entrance side of the conductor guiding groove and a deep groove portion near the end on the exit side of the conductor guiding groove,

the bottom of said deep groove portion is formed to have a plane same to that of the bottom of the winding conductor groove to which the exit end of the conductor guiding groove is connected.

4,639,708

PARALLELOGRAM ELECTRIC COIL HELICALLY WOUND

John D. Weatherly, Manurewa, New Zealand, assignor to Development Finance Corporation of New Zealand, Auckland, New Zealand

Filed Feb. 19, 1985, Ser. No. 703,131

Claims priority, application New Zealand, Feb. 23, 1984, 207264

Int. Cl.⁴ H01F *27/28*

U.S. Cl. 336—200 **5 Claims**

1. A cylindrical coil, with electrically conductive elements arranged to create a magnetic field therein, said magnetic field having an axial component and a transverse component, wherein the said transverse component rotates through 90° over at least part of the length of the coil; said coil being formed from a substrate having said electrically conductive elements thereon, said electrically conductive elements comprising at least one spiral of electrically conductive material in the shape of a parallelogram on a planar surface of the substrate, said at least one spiral being in turn wound around the cylinder as at least one helix.

4,639,709

THERMOSTAT WITH ADJUSTABLE TEMPERATURE RANGE SETPOINT STOPS

Howard Koeis, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

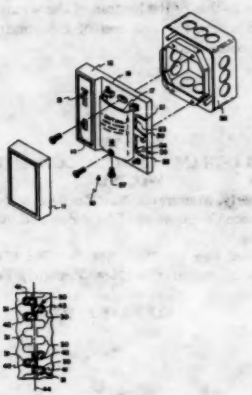
Filed Jun. 6, 1986, Ser. No. 871,339

Int. Cl.⁴ H01H *37/12*

U.S. Cl. 337—360 **5 Claims**

1. A thermostat for control of an environmental temperature, including: base means for support of temperature control means; lever means mounted on said base means with said lever means connected to said temperature control means to set said control means to operate at a selected temperature; said lever means movable between range setpoint stop means; slot means formed into said base means to mount said stop means; said slot means having a geometric design including a plurality of offset recessed openings on opposite sides of said slot means; said stop means having a plurality of projections v 'ich frictionally engage with and are held by said offset recess. l openings; and

said projections being shaped to allow said stop means to be removed, rotated, and reinserted to provide a plurality of



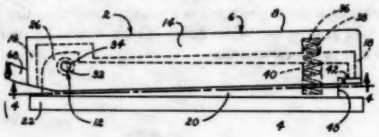
temperature range setpoint stop positions when said stop means are mounted in said slot means.

4,639,710

FOOT PEDAL FOR VARYING RESISTANCE IN AN ELECTRICAL CIRCUIT

Thomas A. McMillan, 101 Dory Rd., N. Palm Beach, Fla. 33408; Henry W. Mitchell, 9744 Dogwood Ave., Palm Beach Gardens, Fla. 33410, and Alvin S. Cecil, 6042 Rogers St., Lake Park, Fla. 33310

Filed Jan. 24, 1986, Ser. No. 822,219
Int. Cl.[4] H01H 3/14; H01C 10/10
U.S. Cl. 338—108 5 Claims



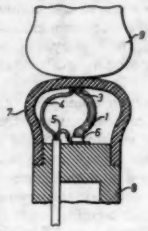
1. A foot pedal device for varying resistance in an electrical circuit comprising a base plate; an actuator foot plate; means pivotally mounting one end of said foot plate to one end of said base plate; means limiting the distance the other ends of said foot plate and base plate can open; spring means biasing said other ends to their open position; a circular recess in said base plate faces said actuator foot plate; an array of circular members positioned in said circular recess; said array comprising a first insulating disc, a first electrode disc, a compressible resistance disc, a second electrode disc, a second insulating disc, and a circular actuating plate; said circular actuating plate having an upwardly facing spherical sent at the center thereof; said actuator foot plate having a downwardly extending spherical surface for engaging said spherical seat to compress said compressible resistance disc to vary the resistance thereof between said first and second electrode discs; electrical conducting means connected to each electrode disc for forming part of an electrical circuit.

4,639,711

SIGNAL TRANSMITTER

Stig Edholm, Killingsvägen 8, S-181 43 Lidingö , Sweden, and Bengt Stenberg, Kottvägen 3, S-191 40 Sollentuna, Sweden

PCT No. PCT/SE83/00445, § 371 Date Aug. 8, 1984, § 102(e) Date Aug. 8, 1984, PCT Pub. No. WO84/02611, PCT Pub. Date Jul. 5, 1984
PCT Filed Dec. 12, 1983, Ser. No. 638,838
Claims priority, application Sweden, Dec. 21, 1982, 8207305
Int. Cl.[4] H01C 10/10, 10/12
U.S. Cl. 338—114 6 Claims



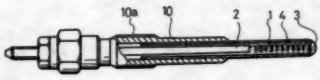
1. A signal transmitter, comprising an elastically deformable body in the form of a matrix consisting of an elastomer containing carbon black as a filling agent, the signal being generated by a change of the electrical resistance of the body when subjected to deformation and outputted via a pair of electrodes, characterized in that said body is an elongate body, the carbon black is of a structure-forming type so that the body has a relatively low electrical resistance in the undeformed state, and in that said electrodes are respectively connected to the opposite longitudinal ends of said elongate body, so that, when the body is deformed between said ends by bending, said resistance becomes only higher.

4,639,712

SHEATHED HEATER

Akihiro Kobayashi, Hazu; Shunzo Yamaguchi, Okazaki; Kiyomi Kobayashi, Kariya, and Hiroaki Takaba, Ohbu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 21, 1985, Ser. No. 789,768
Claims priority, application Japan, Oct. 25, 1984, 59-224381
Int. Cl.[4] H01C 1/03, 1/028; H01M 6/36, 2/18
U.S. Cl. 338—238 3 Claims



1. A sheathed heater, comprising:

a sheath;

an electric heating element disposed within said sheath; and

an electrically insulating filling material packed into said sheath for electrically insulating said electric heating element from said sheath, and for preventing electrical short-circuiting between spacedly-adjacent portions of said electric heating element within said sheath;

said filling material being constituted by 80 mol percent or more of aluminum nitride powder, and 20 mol percent or less of a metallic oxide powder.

4,639,713

THEFTPROOF DEVICE

Tadao Kitagawa, Kamifukuoka; Yutaka Kosuge, Sayama, and Yoichiro Noda, Miyazaki, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo and Kabushiki Kaisha Honda Rokku, Miyazaki, both of, Japan

Filed Sep. 16, 1982, Ser. No. 418,645

Claims priority, application Japan, Sep. 18, 1981, 56-148265; Sep. 18, 1981, 56-148266; Sep. 19, 1981, 56-139435; Oct. 9, 1981, 56-161842; Oct. 9, 1981, 56-161843; Oct. 9, 1981, 56-161845; Oct. 23, 1981, 56-169585; Jul. 23, 1982, 56-128579

Int. Cl.[4] B60R *25/00*; G08B *13/14*; G01V *9/04*; H01J *5/16*

U.S. Cl. 340—63 7 Claims

1. A theftproof device comprising:

an elongate flexible tying member having two ends;

an optical fiber longitudinally extending through said flexible tying member and having two ends, one end of said optical fiber being located at one end of said flexible tying member and another end of said optical fiber being located at the other end of said flexible tying member;

said flexible tying member having a looped portion including said other end thereof;

a light emission element arranged opposite one end of said optical fiber, for converting an electric signal supplied thereto into a corresponding photo signal;

a light receiving element arranged opposite another end of said optical fiber, for converting a photo signal supplied thereto into a corresponding electric signal;

at least one electric wire longitudinally extending through said flexible tying member adjacent said optical fiber, said electric wire being connected to a selected one of said light emission and light receiving elements for transmitting an electric signal transduced by the selected one of said elements, so that (i) when the electric wire is connected to the light emission element, the wire transmits an electric signal to be transduced to a photo signal by said light emission element, and (ii) when the electric wire is connected to the light receiving element, the wire transmits an electric signal which has been transduced from a photo signal by said light receiving element;

a fixture adapted to be fixed to an object which is to be protected from theft,

said flexible tying member being adapted to have said one end thereof passed through said looped portion after said flexible tying member is wound around a solid structure adjacent said object to be protected from theft;

plug means provided at one end of said flexible tying member for mechanically connecting one end of said flexible tying member to said fixture, said plug means being adapted to disconnectably connect said one end of said flexible tying member to said fixture;

a caulking member caulked to join said other end of said flexible tying member to an end part of said looped portion opposite said other end of said flexible tying member,

said caulking member accomodating one of said light emission and light receiving elements;

an electrical circuit arranged in said fixture for supplying an electric signal to said light emission element and also disposed to be supplied with an electric signal generated by said light receiving element; and

connector means arranged within said plug means for electrically connecting said light emission element and said light receiving element to said electrical circuit, one of said light emission and light receiving elements being electrically connected to said connector means by way of said at least one electric wire;

said electrical circuit operating in a manner such that upon occurrence of a change in a photo signal generated by said light emission element and transmitted through said optical fiber, caused by disconnection or cutting of either said optical fiber or said at least one electric wire, said electical circuit is operable in response to a change in an electric signal supplied thereto from said light receiving element, which corresponds to said change in said photo signal, to perform a predetermined warning function.

4,639,714

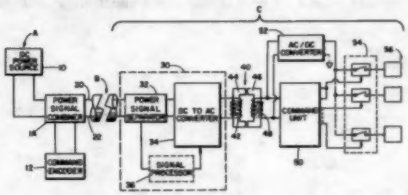
COMBINED POWER AND CONTROL SIGNAL TRANSMISSION SYSTEM

Wayne D. Crowe, Houston, Tex., assignor to Ferranti Subsea Systems, Ltd., London, England

Filed Dec. 21, 1984, Ser. No. 685,262

Int. Cl.[4] H04M *11/04*

U.S. Cl. 340—310 R 20 Claims



1. A method of concurrently transmitting electrical power and communication signals from a source station to a remote station containing controllable power consuming components, the method comprising:

transmitting electrical power along an electrical conductor;

superimposing an electrical communication signal on the electrical power along the electrical conductor for relating command information from the source station to the remote station;

at a remote station, separating the communication signal from the electrical power;

converting the electrical power to a high frequency signal which is encoded as a function of the separated communication signal;

transmitting the encoded high frequency signal across an inductive coupler;

deriving a control signal from the high frequency signal which is transmitted across the inductive coupler which varies in accordance with the communication signal to control operations of the power consuming components; and

powering the components at the remote station with the high frequency signal transmitted across the inductive coupler.

4,639,715

FLASH ANALOG TO DIGITAL CONVERTER

Tuncdolucca, Santa Clara, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Feb. 13, 1984, Ser. No. 579,276

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 AD 3 Claims

1. An analog to digital converter for converting an analog input signal to a digital representation by comparison with a desired reference voltage, said converter comprising:

a scale input for receiving a scale reference signal;

a program input for receiving a program input signal having a first logic value if said scale reference signal has the same voltage polarity as said desired reference voltage and

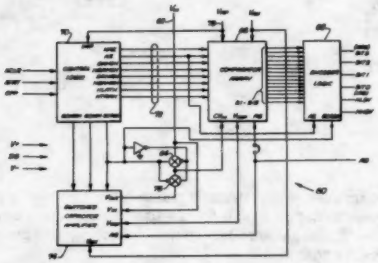
having the opposite logic value if said scale reference signal has the opposite voltage polarity of said desired reference voltage;

incremental reference means coupled to said scale input for providing a plurality of incremental reference voltages;

a plurality of comparator means each for comparing said analog input signal to a respective incremental reference voltage, each comparator means including an amplifier, a pair of input capacitors coupled to said amplifier and switch means for selectively coupling one of said input capacitors either to said analog input signal or to circuit common and for selectively coupling the other input capacitor either to its respective incremental reference voltage or to circuit common; and

control means coupled to said scale input, said program input and said plurality of comparator means, said control means for operating said plurality of comparator means in an auto-zero period and a comparison period, said control means controlling said switch means in a manner adapted to:

(1) apply said analog input signal to said one input capacitor in said auto-zero period and the respective incremental



reference voltage to said other input capacitor in said comparison period if said scale reference signal and said desired reference voltage have the same polarity and said desired reference voltage has a first polarity;

(2) apply the respective incremental reference voltage to said other input capacitor in said auto-zero period and said analog input signal to said one input capacitor in said comparison period if said scale reference signal and said desired reference voltage have the same polarity and the desired reference voltage has a second polarity opposite to said first polarity;

(3) apply said analog input signal and the respective incremental reference voltage to said one and said other input capacitors, respectively, during said comparison period if said scale reference signal and said desired reference voltage are of opposite polarity and said desired reference voltage has said second polarity; and

(4) apply said analog input signal and the respective incremental reference voltage to said one and said other input capacitors, respectively, during said auto-zero period if said scale reference signal and said desired reference voltage are of opposite polarity and said desired reference voltage has said first polarity.

4,639,716

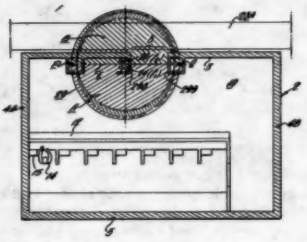
ALARM PACKET SYSTEM

Earl R. Payne, Urbana, Ill., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 19, 1984, Ser. No. 673,006
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—571 **12 Claims**

1. A system for producing alarm-actuating signals in a packet when it is moved in a predetermined direction along a path extending from a first position on one side of a check point to a second position on the other side of said check point, comprising:

field-generating means for producing, adjacent said checkpoint and along said path, first and second mutually-exclusive field regions containing fields of detectable magnitudes and respectively different field characteristics, with the beginning of said second field region positioned further along said path in said predetermined direction than said first field region, and for also producing an additional detectable field condition, different from the field characteristics of said first and second regions, at a predetermined position further along said path than said beginning



of said second field region but not as far along said path as said second position;

circuit means in said packet for producing field-indicating signals indicative of whether said packet is in said first field region, in said second field region, or at said predetermined position where said additional detectable field condition exists; and

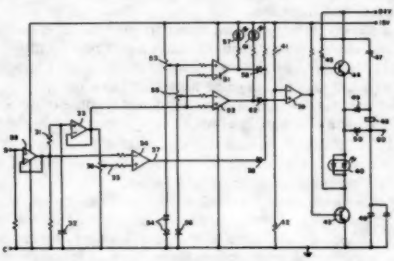
logic means in said packet responsive to said field-indicating signals for producing alarm-actuating signals in said packet only when said packet has been moved along said path from said first field region through said second field region to said predetermined position.

4,639,717

METHOD AND APPARATUS FOR MONITORING FLAME CONDITION

Laurent De Meirsman, Groot-Bijgaarden, Belgium, assignor to Electronics Corporation of America, Waltham, Mass.

Filed Jul. 15, 1985, Ser. No. 755,179
Int. Cl.[4] G08B *17/06*
U.S. Cl. 340—578 **12 Claims**



1. In a multiburner system, a flame monitor for determining the condition of a particular burner flame which has continuous luminous intensity fluctuations during normal operation which vary substantially relative to the average intensity of said flame comprising:

a sensor responsive to said luminous intensity fluctuations for producing a flame signal which varies with said fluctuations over a wide range of intensities;

means for mounting said sensor to receive light from said particular flame with the field of view for said sensor including the portion of the combustion chamber of said system beyond the flame being monitored; and

means responsive to excursions of said flame signal relative to the average value thereof exceeding a threshold level for producing a flame presence signal.

4,639,718

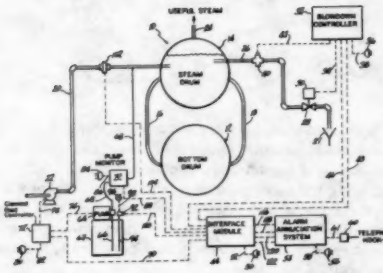
BOILER BLOWDOWN MONITORING SYSTEM AND PROCESS FOR PRACTICING SAME

Kenneth E. Gasper, Leawood, Kans., assignor to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 595,776, Apr. 2, 1984. This application Feb. 25, 1985, Ser. No. 705,179

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—603 4 Claims



3. A boiler blowdown monitoring system comprising:

(a) a boiler blowdown valve located in a boiler blowdown line for releasing boiler water during blowdown operation;

(b) a boiler blowdown sensor located in said blowdown line for sensing the conductivity of the water in said blowdown line;

(c) a boiler blowdown controller for generating first, second and third output signals;

(i) said first output signal being generated to said blowdown valve, said blowdown sensor and an interrogation means simultaneously when a predetermined condition exists and being capable of (aa) causing said blowdown valve to open to release water, (bb) causing said blowdown sensor to start sensing said water conductivity and to start tranferring water conductivity measurements to said controller, and (cc) causing said interrogation means to start an interrogation sequence;

(ii) said second output signal being generated to said blowdown valve, said blowdown sensor and said interrogation means simultaneously when said sensor senses a preselected first (optimum) conductivity level and being capable of (aa) causing said blowdown valve to close, (bb) causing said blowdown sensor to stop sensing and to stop transferring conductivity measurements to said controller, and (cc) causing said interrogation means to stop said interrogation sequence;

(iii) said third output signal being generated to said interrogation means when said sensor senses a conductivity level above a preselected second (maximum) conductivity level or below a preselected third (minimum) conductivity level;

(d) said interrogation being capable of sensing said first output signal, said second output signal, and said third output signal, and capable of performing an interrogation sequence, said interrogation sequence comprising:

(i) waiting a predetermined time period after the sensing of said first output signal, then generating an alarm signal to an alarm annunciating means if said third output signal is sensed; and

(ii) ending said interrogation sequence when said second output signal is sensed.

4,639,719

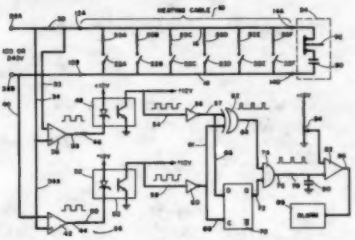
APPARATUS FOR MONITORING CIRCUIT INTEGRITY

Thomas W. Pappano, Tulsa, and David O. Brown, Claremore, both of Okla., assignors to General Signal Corporation, Stamford, Conn.

Filed Mar. 11, 1985, Ser. No. 710,315

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—652 6 Claims



1. Apparatus for monitoring circuit integrity in which an AC voltage source is connected to a plurality of paralleled current consuming loads spaced at points from a voltage source, comprising:

a reactive load in parallel with said current consuming loads at a point in the circuit more distant from the voltage source than any of the current consuming loads being monitored;

a phase shift detector connected to the current consuming loads at a point in the circuit between the voltage source and the nearest current consuming load being monitored, the phase shift detector being sensitive to the shift in current phase induced by said reactive load; and

a signal means connected to and actuated by said phase shift detector, the signal means providing a warning when the phase shift induced by said reactive load is lost.

4,639,720

ELECTRONIC SKETCH PAD

William P. Rympalski, Melbourne; James S. Herstein, Satellite Beach, and Roger L. Ritenour, Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 12, 1981, Ser. No. 224,067

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—712 30 Claims

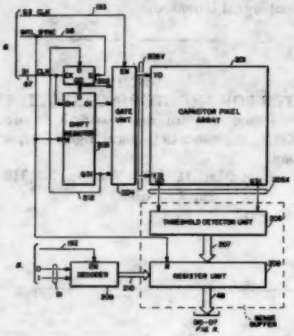
1. A display device comprising:

a transparent array of variable capacitance pixels supported by way of a first member, each variable capacitance pixel undergoing a change in capacitance in response to the coupling of a conductive medium at the surface of said first member;

an array of display element pixels supported by way of a second member positioned adjacent said first member, so that said array of variable capacitance pixels overlies said array of display element pixels, each of said display element pixels being selectively energized in response to control signals applied thereto; and

control means, coupled to said transparent array of variable capacitance pixels and said array of display element pixels, for scanning said transparent array of pixels and selec-

tively causing a prescribed control signal to be coupled to a respective display element pixel corresponding to a



respective variable capacitance pixel at which a change in capacitance has been detected.

4,639,721

DATA SELECTION CIRCUIT FOR THE SCREEN DISPLAY OF DATA FROM A PERSONAL COMPUTER

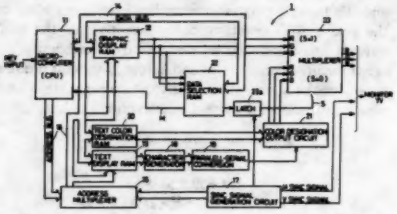
Masayuki Eto, Yaita; Kazuyoshi Izumi; Fuyuki Kobayashi, both of Utsunomiya; Mamoru Kawagishi, and Masahiro Oosawa, both of Yaita, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 29, 1983, Ser. No. 536,965

Claims priority, application Japan, Oct. 9, 1982, 57-177990; Oct. 12, 1982, 57-179248

Int. Cl.[4] G09G 3/16

U.S. Cl. 340—747 2 Claims



1. A display system for a microcomputer comprising:

a graphics display RAM for storing graphic data as a 3-bit red, green, blue (RGB) color signal for each pixel of graphic data;

a text display RAM for storing text data;

a keyboard for inputting said graphic and text data as well as display instructions;

a color monitor for displaying color pixels of both said graphic and text data thereon;

multiplexer means for reading out said graphic and text data from said graphic display and text display RAMs to said color monitor;

priority read out means including a data select RAM for storing priority bit signals for selectively reading out either said graphic data or text data for given pixels of displayed information, said priority bit signals being addressed in said data select RAM by said RGB color signals stored in said graphic display RAM and output to said multiplexer means.

4,639,722

LIQUID CRYSTAL DISPLAY APPARATUS

Tetsuo Urabe, Matsudo, and Shigeru Kojima, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

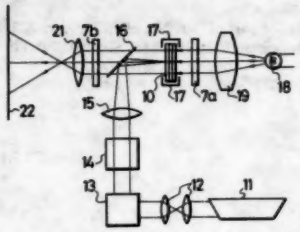
PCT No. PCT/JP82/00442, § 371 Date Jul. 18, 1983, § 102(e) Date Jul. 18, 1983, PCT Pub. No. WO83/01841, PCT Pub. Date May 26, 1983

PCT Filed Nov. 19, 1982, Ser. No. 530,596

Claims priority, application Japan, Nov. 20, 1981, 56-186334

Int. Cl.[4] G09G 3/36

U.S. Cl. 340—784 4 Claims



1. A liquid crystal display apparatus comprising:

a pair of plates including internal opposing electrodes,

a smectic liquid crystal body confined between said plates and being bistably switchable in polarity between a first orientation state and a second orientation state in which molecules in said first and second orientation states have polarities equivalent in energy and have dipole moments in opposite directions,

means for initially orienting said molecules in said first state,

irradiating means for irradiating an energy beam onto said molecules so as to heat the same and change said molecules from said first orientation state into a third orientation state in which said molecules are substantially perpendicular to said plates, and

means for applying a weak DC electric field to said molecules to change said orientation state from said third state to said second state while the remainder of said molecules remain in said first state thereby providing information recording.

4,639,723

DATA DISPLAY SYSTEM

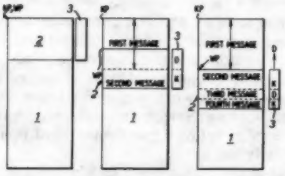
Geoffrey J. Boughton, Sandy, England, assignor to International Computers Limited, London, England

Filed May 24, 1984, Ser. No. 613,523

Claims priority, application United Kingdom, Jun. 8, 1983, 8315752

Int. Cl.[4] G09G 1/02

U.S. Cl. 340—799 4 Claims



1. A method of handling data in a data terminal having a display area in which only a limited number of data lines can be displayed including the steps of:

entering data lines consecutively into the terminal until said

limited number of data lines are displayed in the display area;

shifting the displayed data lines relative to the display area to remove data lines sequentially from the display area to thereby make available space for further data lines to be displayed;

selectively storing indicator flags in response to operator input signals which select particular data lines, wherein said indicator flags indicate whether the data lines, on removal from the display area, are to be retained; and,

as the data lines are removed sequentially from the display area, retaining in a buffer store, having a capacity to store a greater number of lines of data than said limited number, each data line being indicated for retention.

4,639,724

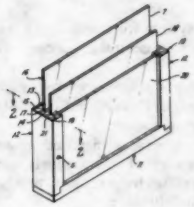
GRAPHIC DISPLAY

Mauro G. Togneri, P.O. Box 12818, Houston, Tex. 77017

Continuation of Ser. No. 688,398, May 20, 1976, abandoned. This application Sep. 27, 1978, Ser. No. 946,398

Int. Cl.[4] G08B *5/00*

U.S. Cl. 340—815.01 **20 Claims**



1. A grapic display system for displaying electrical signals by light sources in the presence of an external lighting system, comprising:

a frame;

a set of plates; one of said plates having

means for supporting such light sources;

means for connecting said plates to said frame;

means for connecting such light sources to such electrical signals; and

said plates including glare means for preventing substantial reflection of incident light on one plate from said external lighting.

4,639,725

PICTURE DISPLAY CASE

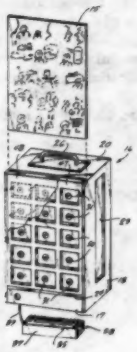
Martin G. Franke, Terao-Kamata 1-10-12, Ayase-Shi, Kanagawa-Ken, Japan (252), assignor to Martin G. Franke, Tokyo, Japan

Filed Apr. 4, 1984, Ser. No. 596,496

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—815.02 **6 Claims**

1. In a picture display case: a frame; a light panel supported in said frame; a plurality of lamps fixedly mounted on said light panel in spaced relationship; support means in said frame for removably receiving and supporting different selected picture panels individually with the different picture panels containing varying numbers and sizes of pictures as well as different arrangements of pictures, such panels being supported in front of said light panel so that all of the pictures on the particular picture panel in said frame can be illuminated individually by the selective energization of said lamps; control means connected to regulate the transmission of electrical energy to regulate the transmission of electrical energy to said lamps and actuatable for producing the energization of said lamps in different sequences and different combinations for illuminating all of the pictures on the panel selectively; and adjusting means connected to be actuated according to the panel in said frame for adjusting said control means to energize said lamps in the particular sequence and particular combinations that accommodate the number of pictures on the selected picture panel in the machine and the arrangement or size of such pictures on the panel.



4,639,726

RADIO COMMUNICATION APPARATUS DISABLED ON RECEPTION OF A PREDETERMINED SIGNAL

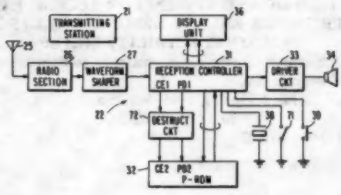
Yoshio Ichikawa; Masaaki Akahori; Daisuke Ishii; Kazuyuki Tsunoda; Yohichiro Minami, and Koichi Nagata, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,292

Claims priority, application Japan, Aug. 18, 1983, 58-150801; Jul. 17, 1984, 59-147008

Int. Cl.[4] H04Q *7/00;* **H04B** *7/00*

U.S. Cl. 340—825.44 **6 Claims**



1. A pager receiver comprising:

call signal receiving means for carrying out a call signal reception operation of selectively receiving a call signal specific to said pager receiver;

tone producing means for producing a call tone after reception of said call signal;

resetting means for resetting said call tone after production of said call tone;

additional signal receiving means for carrying out an additional signal reception operation of receiving an additional signal succeeding said call signal;

checking means for checking whether or not said additional signal is identical with a predetermined signal and producing an signal indicating said identity;

means responsive to said identity signal for driving said tone producing means to make said tone producing means continuously produce another tone signal, and to disable said call signal receiving means and said resetting means.

4,639,727

DATA TRANSMISSION SYSTEM OF OPTTO-COUPLERS

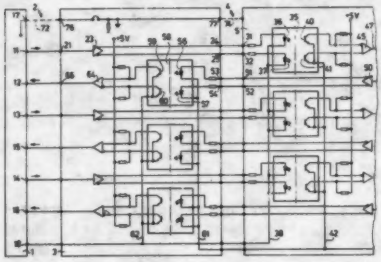
Udo Blasius, and Anton Rodi, both of Leimen, Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 483,661, Apr. 11, 1983, abandoned. This application Jul. 3, 1985, Ser. No. 752,481

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213527

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.57 6 Claims



1. Data transmission system having at least two spatially separated devices mutually connected by electric lines affording data transmission therebetween in both directions, the devices each having at least one data output and a data input separated from the data output, comprising an optocoupler and an electrical receiving unit included in at least one of the devices, said optocoupler having an input connected to the data input of said one device, and having an output connected to said electrical receiving unit of said one device, the data inputs and the data outputs of each of said spatially separated devices being insulated from one another and the data outputs of one of the spatially separated devices being connected with the respective data inputs of another one of the devices, and being similarly connected in the opposite direction.

4,639,728

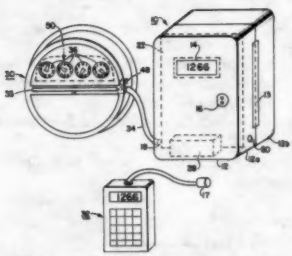
METHOD OF AND SYSTEM FOR ACCUMULATING VERIFIABLE ENERGY DEMAND DATA FROM REMOTE ELECTRICITY METERS

Scott C. Swanson, Roswell, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Sep. 16, 1985, Ser. No. 776,719

Int. Cl.[4] G08C *5/12*

U.S. Cl. 340—870.03 12 Claims



1. A system for accumulating verifiable energy demand data from a remote electricity meter of a type having at least one register indicating accumulated demand and generating pulses corresponding to demand rate, comprising:

means for detecting pulses generated by said meter;

means for counting the pulses detected by said detecting means during a predetermined measurement interval to develop an interval pulse count;

means for digitally encoding an output of said register;

means for reading an output of said encoding means at the last of a predetermined number of measurement intervals;

solid state memory means for storing data; and

means for storing interval pulse counts and encoded register readings in different addressable locations of said memory means.

4,639,729

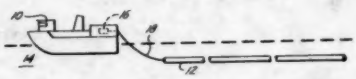
TELEMETRIC SYSTEM

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Sep. 23, 1985, Ser. No. 779,073

Int. Cl.[4] G08C *19/16*

U.S. Cl. 340—870.13 9 Claims



1. A telemetric system for transmitting time-division multiplexed data pulses to a central recording station, said system comprising:

(a) a cable having a plurality of transmission channels extending the length thereof and operably coupled to said central recording station;

(b) a plurality of sensors disposed at substantially equal intervals along each of said channels, said sensors on each channel being offset from sensors on adjacent channels by a predetermined distance;

(c) means for time-division multiplexing a plurality of data pulses traveling on each of said channels; and

(d) means for time-division multiplexing said multiplexed data pulses from each of said channels to said central recording station.

4,639,730

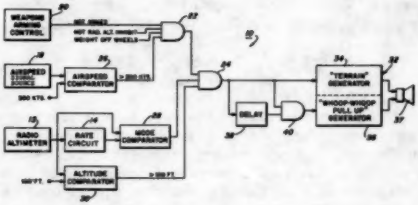
EXCESSIVE TERRAIN CLOSURE WARNING SYSTEM

Noel S. Paterson, Bothell, and Everette E. Vermilion, Seattle, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed May 13, 1983, Ser. No. 494,591

Int. Cl.[4] G08B *23/00*; G01C *21/00*; G06F *15/48*

U.S. Cl. 340—970 16 Claims



1. A warning system for providing a warning to a pilot of an aircraft of an excessive closure rate with terrain, comprising:

means for providing signals representative of the altitude of the aircraft above the ground, the closure rate of the aircraft and the airspeed of the aircraft; and

means responsive to signals representative of the altitude of the aircraft above ground, the closure rate of the aircraft and the air speed of the aircraft for generating a warning if the aircraft is below approximately 1800 feet above

ground and has a closure rate in excess of 15,000 feet per minute and the airspeed of the aircraft is greater than a predetermined value;

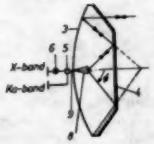
wherein said aircraft is fitted with weapons, and wherein said warning system includes means responsive to the arming of the weapons of the aircraft for enabling the generation of said warning only when the weapons are not armed.

4,639,731

MONOPULSE FEEDER FOR TRANSMITTING AND RECEIVING RADAR SIGNALS WITHIN TWO MUTUALLY SEPARATED FREQUENCY BANDS

Göran R. Karlsson, Älvängen, and John H. S. Karnevi, Gothenburg, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Aug. 29, 1984, Ser. No. 645,447
Claims priority, application Sweden, Sep. 14, 1983, 8304937
Int. Cl.[4] G01S 13/44
U.S. Cl. 342—147 3 Claims



1. A two frequency band monopulse radar antenna system comprising: a two-band Cassegrain reflector array having a parabolic reflector with a focal point and a hyperbolic reflector having a first focal point coinciding with the focal point of said parabolic reflector and a second focal point; and monopulse feeder means positioned at the second focal point of said hyperbolic reflector and being adapted to be connected to a first transmission means for a first radar band and to a second transmission means for a second radar band; said monopulse feeder means having

a mouth section including a first pair of openings (81*a*, 81*b*) with the same cross-sectional dimensions, and a second pair of openings (82*a*, 82*b*) with the same cross-sectional dimensions, all of said openings being in the same plane,

a wave guide section having one end for connection to said transmission means and another end, first and second pairs of waveguides and third and forth pairs of wave guides for connecting said ends, said one end including a first (91*a*, 91*b*) and a second (92*a*, 92*b*) pair of openings for providing communication of said first and second pairs of wave guides with the first transmission means, and said one end further including a third (93*a*, 93*b*) and a fourth (94*a*, 94*b*) pair of openings for providing for communication of said third and fourth pairs of waveguides with the second transmission means, and

a matching section connecting said mouth section to the other end of said wave guide section, said matching section including a first wave guide means for merging the first pair of wave guides of said wave guide section into a single wave guide connected to one of the openings of said first pair of openings of said mouth section, a second wave guide means for merging the second pair of wave guides of said wave guide section into a single wave guide connected to the other opening of said first pair of openings of said mouth section, a third wave guide means for merging the third pair of wave guides of said waveguide sections with a single wave guide connected to one of the openings of said second pair of openings of said mouth section and a forth wave guide means for merging the forth pair of wave guides of said wave guide section into a single wave guide connected to the other opening of said second pair of openings of said mouth section

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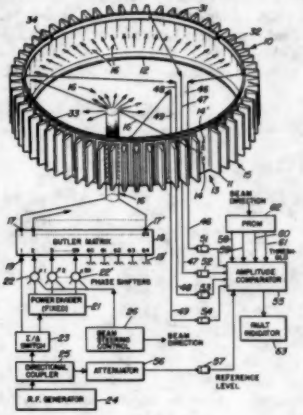
4,639,732

INTEGRAL MONITOR SYSTEM FOR CIRCULAR PHASED ARRAY ANTENNA

Joseph H. Acoraci, Phoenix, and Alvin W. Moeller, Kingsville, both of Md., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 22, 1985, Ser. No. 704,687
Int. Cl.[4] H01Q 3/26; G01S 7/40; H04B 17/00
U.S. Cl. 342—371 7 Claims



1. In a circular phased array antenna having a mounting ring, a plurality of radiating elements spaced about the circumference of the mounting ring, means of feeding r.f. currents to said radiating elements with relative amplitudes and phases whereby energy is radiated from said antenna in a focused beam, and means for steering said beam to a selected direction, a monitor system for warning of failures in the array antenna comprising,

a monitor signal circuit secured to said array mounting ring, said signal circuit being divided into a plurality of like segments, each said segment being formed as a microstrip printed circuit and including:

a plurality of probes, each said probe being located in near proximity to separate ones of said radiating elements of said array and receiving energy principally from its associated one of said radiating elements;

individual phase shifter means connected to each said probe;

a transmission line and

individual coupling means connected to each said phase shifter means for coupling energy from said phase shifter means into said transmission line, said phase shifter means and said coupling means for each said probe being adjusted to provide a phase shift negative to and an amplitude corresponding to the relative phase and amplitude of the r.f. current in the radiating element associated with that said probe;

said segments being secured to said array mounting ring end to end so as to encircle said array mounting ring;

data storage means having stored therein threshold data indicative of the amplitude of the signal appearing on said transmission line of each said signal circuit segment for each selected direction of the array beam for a normally operating array;

amplitude comparator means for comparing the amplitude of signal appearing on said transmission line for each said signal circuit segment at a particular beam direction of said array with data retrieved from said storage means for

each said transmission line for that particular beam direction; and

fault indicator means for signaling a fault condition in said array whenever the difference between the signal amplitude and the threshold data retrieved from said storage means and compared in said comparator means for any one of said transmission lines exceeds a predetermined amount.

4,639,733

DIRECTION FINDING

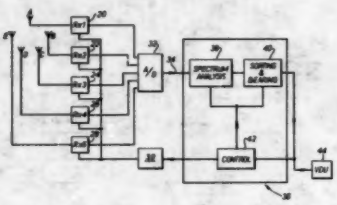
Nigel J. R. King; Ian W. N. Pawson, both of Bracknell; Michael P. Baker, Reading; Robert N. Shaddock, Binfield, and Edward V. Stansfield, Earley, all of England, assignors to Racal Communications Equipment Limited, Berkshire, England

Filed May 11, 1984, Ser. No. 609,232

Claims priority, application United Kingdom, May 11, 1983, 8312942

Int. Cl.[4] G01S 5/02

U.S. Cl. 342—424 9 Claims



1. An interferometer-type direction finding system including at least five antennas defining a non-linear array providing 360° coverage, and such that the spacing between any pair of apertures is greater than a wavelength of the radio signal to be received, means for receiving radio energy detected by the antennas over a predetermined band, analysing means for effectively outputting the amplitude and relative phase of any radio signal received by each antenna in each of a plurality of frequency intervals within said band, means for effectively identifying from said output any received radio signal within said band, and means for processing only the relative phase at each antenna of any identified radio signal to produce only one possible value of the bearing of the source from which any said identified signal originates.

4,639,734

SUPPORT STRUCTURE FOR PARABOLOID REFLECTOR

Edward J. Schock, 1000 Conestoga Rd. C-347, Rosemont, Pa. 19010

Filed Apr. 20, 1984, Ser. No. 602,348

Int. Cl.[4] H01Q 1/14, 15/16

U.S. Cl. 343—912 4 Claims

1. A support structure for a paraboloid reflector comprising:

a plurality of elongated ribs,

each rib having a pair of parallel flat faces displaced one from the other by the uniform thickness of the rib,

each flat face of each rib having an inwardly curved forward edge,

the thickness of each rib being substantially less than the width of the two flat faces of the rib,

each flat face of each rib being a segment of a plane parallel to the focal axis of the paraboloid,

the forward edges of the flat faces of the ribs defining an inwardly contoured support surface for a reflecting surface,

wherein the improvement comprises:

in a plurality of sets of ribs,

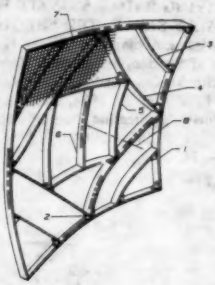
each set arranged such that the planes of the flat faces of four equal-length ribs intersect in two squares on a plane perpendicular to the focal axis of the paraboloid,

the two squares separated by the uniform thickness of the ribs, each square having the focal axis of the paraboloid at its center,

the sets of ribs being joined together in the following pattern: a first set of four equal-length ribs having each end of each rib joined to an end of another rib in the set,

the first set being an outermost square,

within the outermost square there being a plurality of additional nested sets of four equal-length ribs,



the plurality including at least a second and third set of ribs, each rib of the second additional set extending between pairs of adjacent ribs in the outermost square,

and of the third set extending between pairs of adjacent ribs in the second set,

each end of each rib in the additional sets joining a rib in the next outer square along the length of that rib in the next outer square,

the planes of the flat faces of each rib in the additional sets intersecting the planes of the flat faces of each rib in the next outer square at forty-five-degree angles on a plane perpendicular to the focal axis of the paraboloid.

4,639,735

APPARATUS FOR DRIVING LIQUID JET HEAD

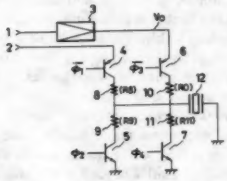
Mitsuru Yamamoto, Yokohama; Kunio Watanabe, Kawasaki, and Junji Shimoda, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 616,703

Claims priority, application Japan, Jun. 14, 1983, 58-106436

Int. Cl.[4] G01D 15/16

U.S. Cl. 346—1.1 2 Claims



1. A method of ejecting a droplet of a liquid from a discharge port in communication with a liquid chamber, comprising the steps of:

reducing the volume of said liquid chamber without ejecting a droplet of liquid from said discharge port;

suddenly increasing the volume of said liquid chamber to retract a meniscus of the liquid from said discharge port;

suddenly reducing the volume of said liquid chamber, substantially immediately after said sudden increase in volume and in substantial synchronism with the maximum

velocity of the natural recovery of the meniscus toward said discharge port, to eject liquid from said discharge port; and

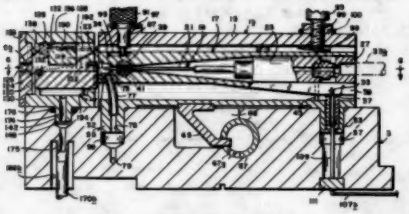
increasing the volume of said liquid chamber to an original condition.

4,639,736

INK JET RECORDER

Dieter Jochimsen, Winchester, Mass., assignor to Iris Graphics, Inc., Stoneham, Mass.

Filed Jul. 9, 1985, Ser. No. 753,454
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **54 Claims**



1. An ink jet recorder adapted for pressure ejecting a fine ink stream along a predetermined path to a recording surface, said recorder being of the type having, a nozzle unit from which said ink stream is ejected toward the recording surface, an ink reservoir supplying electrically conductive ink to said nozzle unit, means for selectively charging the ink projected from said nozzle unit and means for deflecting charged ink from said path, said recorder comprising:

(a) a mounting block having a reference surface on said mounting block;

(b) a first port in said mounting block for connecting said mounting block to a suction pump;

(c) corresponding first and second mating means in said mounting block and said nozzle unit, respectively, for positioning said nozzle unit in an operative position on said reference surface;

(d) a first conduit in said mounting block connecting said first port with said first mating means;

(e) a vacuum guide in said nozzle unit having an inlet end in the region in which the ink is ejected from said nozzle unit; and

(f) a second conduit in said nozzle unit connecting an outlet end of said vacuum guide with said second mating means whereby said second conduit communicates with said first conduit and the suction pump is connected to said vacuum guide.

4,639,737

TENSIONABLE ELECTRODES FOR CHARGING AND/OR DEFLECTING FLUID DROPLETS IN FLUID-JET MARKING APPARATUS

Richard Sutera, Hauppauge, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.

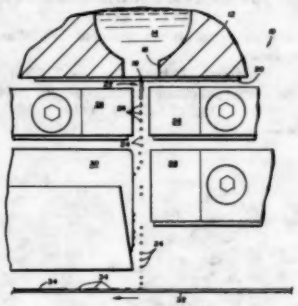
Filed Oct. 10, 1985, Ser. No. 786,124
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **24 Claims**

1. An electrode for use in a fluid jet marking apparatus having means to generate at least one linear array of fluid droplet streams, means for charging selected ones of said droplets in said streams and means for electrostatically deflecting said selected charged droplets towards a catching structure, wherein said electrode comprises said means for charging and/or said means for deflecting and includes:

a flexible and tensionable electrode member; and

mounting means for mounting said electrode member in confronting, substantially parallel alignment to the linear array of fluid droplet streams, said mounting means including

(a) a pair of mounting arm means in spaced-apart relationship, said pair of mounting arm means for mounting respective end portions of said electrode member therebetween, one of said pair being rigid and the other one of said pair being pivotal, and



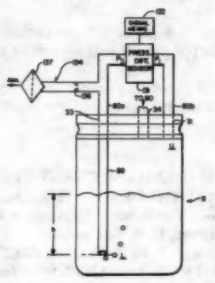
(b) tensioning means connected to said other pivotal one of said pair of arm means for pivotally displacing said other pivotal one relative to said rigid one to responsively tension said electrode member between said pair of mounting leg means.

4,639,738

INK LEVEL DETECTION SYSTEM FOR INK JET PRINTING APPARATUS

Lawrence R. Young, West Lebanon, N.H.; Gregory J. Sexton, Dayton, Ohio; Randal L. Mullins, Xenia, Ohio, and Brian D. Bradley, Beavercreek, Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,549
Int. Cl.[4] G01D *15/18*; G01F *23/18*
U.S. Cl. 346—75 **5 Claims**



1. Ink jet printing apparatus, adapted for using an ink supply/return cartridge and having (i) a print head assembly, (ii) ink supply means for providing ink from such cartridge to said assembly and (iii) ink return means, including means to induce a negative pressure within such cartridge and an ink return conducit, an improved level detection construction for cooperating with such a cartridge, including

(a) means for sensing and signalling a predetermined pressure difference between first and second pressure regions;

(b) first conduit means connectible to a first port of such cartridge for transmitting a representative of the pressure within an upper, evacuated cartridge region to said sensing means; and

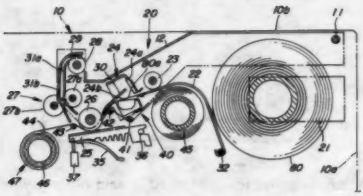
(c) second conduit means connectible to the upper port of a cartridge tube for transmitting a representation of the pressure at a lower port of such cartridge tube, said second conduit means including a branch passage to a source of atmospheric pressure and flow restrictor means in such branch passage.

4,639,739

THERMAL TRANSFER RECORDING METHOD AND APPARATUS

Teruo Tsutsumi, Tama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Sep. 12, 1985, Ser. No. 775,264
Claims priority, application Japan, Nov. 30, 1984, 59-254331
Int. Cl.[4] G01D 15/10
U.S. Cl. 346—76 PH 17 Claims



1. A thermal transfer recording method for use in a thermal transfer recording apparatus having a thermal head, a roll of recording paper of ordinary paper material, a roll of an ink ribbon, cutting means for cutting of a part of said roll of recording paper, a platen roller, and pressure releasing means for releasing said thermal head and said platen roller from the pressure contacted state, said method comprising the steps of:

unwinding said roll of recording paper and said ink ribbon to bring them into pressure contact with said thermal head while superposing them one over the other;

selectively transferring ink from said ribbon onto said recording paper by means of said thermal head;

separating said recording paper away from said ink ribbon by said pressure releasing means;

transporting said recording paper until the last ink transferred part of said recording paper reaches said cutting means while holding said ink ribbon in a stationary position;

cutting said recording paper by said cutting means so that the ink transferred part of said recording paper is cut off; and

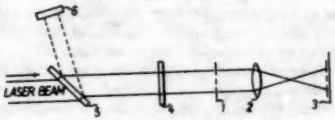
transporting said recording paper until the leading end thereof is located in the proximity of said thermal head.

4,639,740

LASER MARKING ENHANCEMENT SYSTEM USING REFLECTION FROM THE MASK

David C. Hamilton, Cottingham, England, assignor to Laser Applications Limited, Hull, England

Filed Apr. 5, 1985, Ser. No. 720,299
Int. Cl.[4] G01D 9/00, 9/42; G02B 5/30; G03B 27/02
U.S. Cl. 346—76 L 11 Claims



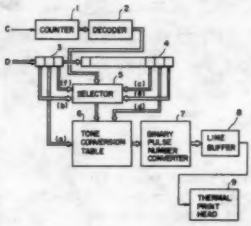
1. A method of laser marking of an article of the type in which a stencil-type mask having opaque parts and open parts is imaged onto an article to be marked by passing a pulsed laser beam through the open parts of the stencil-type mask and onto the article to be marked, wherein the pulsed laser beam is caused to be linearly polarized and wherein at least part of the laser beam energy is reflected from the opaque parts of the mask and is collected and redirected to the mask to thereby increase the overall transmission and hence the efficiency of the process.

4,639,741

BLOCK-DIVIDED DRIVING OF A THERMAL PRINTHEAD

Takashi Inoue, Asaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,579
Claims priority, application Japan, Jul. 16, 1984, 59-147148
Int. Cl.[4] G01D 15/10
U.S. Cl. 346—76 PH 4 Claims



1. A system for driving a line-type thermal printhead block to block in sequence from one end to the other, comprising:

detecting means for detecting as to whether a pixel data for a dot of interest is for an end dot of a block, said detecting means supplying a first output indicating as to whether said dot of interest is an end dot of a block or not;

address forming means for forming an address using pixel data at least for two adjacent pixel data on both sides of said pixel data for said dot of interest;

storing means for storing a predetermined table of energy levels, said storing means receiving said first output from said detecting means and said address from said address forming means for accessing a particular energy level in said table and supplying as its output a driving energy level for said dot of interest; and

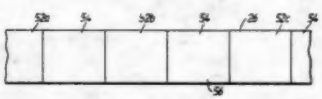
means for driving said dot of interest in said thermal printhead in accordance with said driving energy level supplied from said storing means.

4,639,742

METHOD AND APPARATUS FOR PRINTING AN IMAGE

Tomohiko Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 23, 1985, Ser. No. 779,064
Claims priority, application Japan, Oct. 8, 1984, 59-210915
Int. Cl.[4] G01D 15/10
U.S. Cl. 346—76 PH 19 Claims



1. An apparatus for printing an image on a recording medium comprising:

means for holding the recording medium opposite to an ink donor sheet, said ink donor sheet having a first portion

provided with a colorant capable of being transferred onto the recording medium to print the image and a second portion provided with a transfer ratio regulating material capable of being transferred onto the recording medium to achieve a predetermined gradation pattern of the printed image by changing the amount of transfer of said colorant onto the recording medium;

means for transferring said colorant and said transfer ratio regulating material onto the recording medium held by said holding means in accordance with a predetermined gradation pattern; and

means for disposing said ink donor sheet so that the recording medium overlaps said second portion to transfer said transfer ratio regulating material in accordance with the gradation pattern of the image to be printed on the recording medium and then overlaps said first portion to form the image on the surface of the recording medium having said transfer ratio regulating material transferred thereon.

4,639,743

THERMAL PRINTER

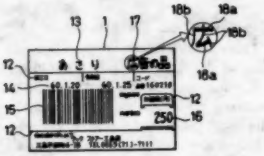
Yasuhiro Sakura; Hitoshi Nimura, and Mamoru Ishikawa, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,611

Claims priority, application Japan, Feb. 25, 1985, 60-35808

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **2 Claims**



1. A thermal printer comprising: recording papers each having multi-color-forming temperature characteristic; a thermal head containing a multiplicity of heating elements and capable of printing the recording paper over the entire width thereof while being kept in contact therewith during its unidirectional motion; at least two print buffers for feeding print data to control energization of the heating elements of said thermal head; and a current on-time control circuit for differentially setting the on-time periods of a constant current to the heating elements of said thermal head in response to selection of said print buffers under the predetermined condition that a basic color for general print data is formed at a low temperature while a different particular color for specific print data is formed at a high temperature in a printing operation on the recording paper by the heating elements of said thermal head, wherein horizontal line segments of the characters transverse to the recording paper feed direction are set to be thick in the character pattern of the specific information to be printed in said different particular color.

4,639,744

RECORDING APPARATUS

Yoshio Uchikata, Yokohama; Mineo Nozaki, Kawasaki; Osamu Asakura, Tokyo, and Masasumi Nagashima, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 553,817

Claims priority, application Japan, Dec. 1, 1982, 57-209441; Dec. 3, 1982, 57-211294

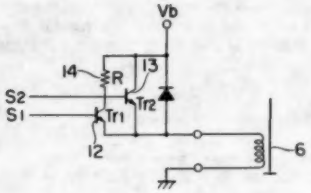
Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **28 Claims**

1. A recording apparatus comprising:

means supplied with electric power for moving a recording head for effecting recording toward a recording medium and for holding the recording head in a recording position;

means for generating timing signals; and



means for controlling the value of the electric power so as to gradually vary the electric power applied to said holding means by the timing signals from said generating means.

4,639,745

OPTICAL RECORDING MEDIUM

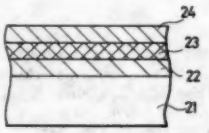
Fumio Matsui; Shuichi Yanagisawa; Yoshiyuki Kakuta, and Atsushi Yoshizawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,200

Claims priority, application Japan, Jan. 11, 1984, 59-3118; Jan. 14, 1984, 59-5351

Int. Cl.[4] G01D *15/34*

U.S. Cl. 346—135.1 **4 Claims**



1. An optical information recording medium comprising:

a substrate;

a first recording layer of a first light-sensitive material on said substrate; and

a second recording layer of a second light-sensitive material on said first recording layer, said second light-sensitive material being different from said first light-sensitive material, wherein said first light-sensitive material is nitrocellulose and said second light-sensitive material is Indocyanine Green.

4,639,746

IMAGE RECORDING APPARATUS

Mitsuru Yamamoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,708

Claims priority, application Japan, Jul. 6, 1983, 58-122971

Int. Cl.[4] G01D *15/18, 15/10*

U.S. Cl. 346—140 R **19 Claims**

1. An image recording apparatus for recording an image on a recording medium, comprising:

image signal generating means for obtaining an image signal which represents an image to be recorded in a predetermined area on the recording medium;

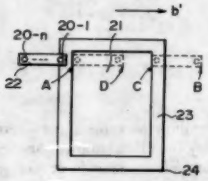
additional signal generating means for obtaining an additional signal which represents additional data to be recorded outside the predetermined area on the recording medium;

recording means including a plurality of recording elements for recording on the recording medium in response to the signals from said image signal generating means and said

additional signal generating means, wherein at least one other recording element, which does not record additional data, scans the predetermined area during the recording of the additional data;

scanning means for providing relative movement between said recording means and the recording medium, the predetermined area being defined by the relative movement of said recording means and the recording medium; and

control means for applying the additional signal to at least one of said plurality of recording elements when said at least one recording element scans the recording medium outside the predetermined area, such that said at least one recording element records the additional data outside the predetermined area on the recording medium.



4,639,747

RECORDING HEAD DRIVE CONTROL APPARATUS

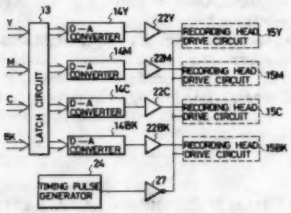
Nobuaki Sakurada, Yokohama; Hideaki Kawamura, and Takashi Sasaki, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,340

Claims priority, application Japan, Jun. 22, 1983, 58-112563

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **16 Claims**



1. A recording apparatus comprising:

a plurality of recording heads for recording with recording densities that vary in response to the level of drive signals;

a plurality of drive circuits for driving said plurality of recording heads;

a control circuit for outputting variable-level drive signals through said drive circuits to said recording heads; and

timing pulse supplying means for supplying drive timing pulses for said recording heads to said drive circuits,

wherein said supplying means supplies the drive timing pulses during operation of the recording apparatus even when all or some of said plurality of recording heads are not to record and said control circuit controls the levels of the drive signals for the recording heads which are not to record to be less than a threshold value below which said recording heads do not perform recording.

4,639,748

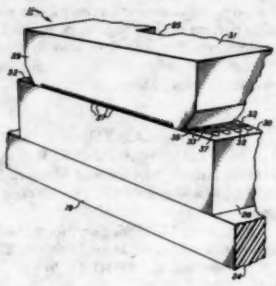
INK JET PRINTHEAD WITH INTEGRAL INK FILTER

Donald J. Drake, Rochester; William G. Hawkins, and Michael R. Campanelli, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1985, Ser. No. 781,554

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **13 Claims**



1. An ink jet printhead comprising:

first and second substrates;

one surface of the first substrate containing a linear array of heating elements and each heating element having individual addressing electrodes, the heating elements and addressing electrodes being coated with a passivation layer;

one surface of the second substrate containing a pattern of recesses, including a linear array of parallel channel recesses opening on one end through an edge of the second substrate and the other ends communicating with a common manifold recess, an internal chamber recess being provided by an enclosing wall inside of and surrounded by the manifold recess, a plurality of passageway recesses being formed perpendicularly through the chamber walls to provide communication between the internal chamber and the manifold;

a fill hole being provided through the second substrate, one end of the fill hole entering the internal chamber recess;

the surface of the first substrate having the heating elements and addressing electrodes being aligned with and bonded against the surface of the second substrate having the recesses, so that each channel has one of the heating elements therein spaced a predetermined distance from the channel open ends that serve as droplet emitting nozzles;

means for providing ink at a predetermined pressure to the fill hole, so that ink travels through the fill hole to the internal chamber, through the passageways to the manifold, and from the manifold to fill the channels and form a meniscus at each nozzle;

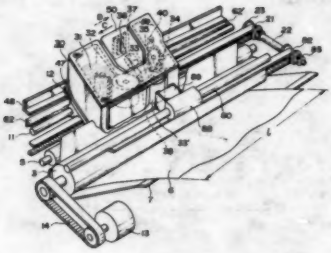
the ink being filtered as it flows through the passageways because the cross-sectional flow areas of each of the passageways are smaller than each of the cross-sectional flow areas of the channels while the total flow area of the passageways is greater than the total flow area of the channels; and

means for selectively placing a current pulse representing digitized data signals on the addressing electrodes to temporarily vaporize the ink contacting the passivated heating elements and produce bubbles which expel droplets of ink from the nozzles of the selectively pulsed heating elements.

4,639,749
PRINTING APPARATUS

Yoshio Ito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1985, Ser. No. 711,179
Claims priority, application Japan, Mar. 17, 1984, 59-51751
Int. Cl.[4] G01D 15/14
U.S. Cl. 346—153.1 10 Claims



1. A printing apparatus, comprising:

means for intermittently feeding a recording material;

supporting means for detachably supporting a cartridge having a rotatable image bearing member, developing means for developing with developer powder an electrostatic latent image formed on said image bearing member and cleaning means for removing from said image bearing member the developer powder not transferred to the recording material;

means for applying to said image bearing member image information to form the electrostatic latent image thereon, said image information applying means being fixed on said supporting means;

means for reciprocally moving said supporting means in a direction crossing with a direction of the recording material feed;

means for contacting said image bearing member to the recording material to transfer to the recording material a powder image formed on said image bearing member during forward movement of said supporting means, and for disengaging said image bearing member from the recording material;

means for rotating said image bearing member so that it passes through a station where said developing means operates, a station where it is contacted to the recording material and a station where said cleaning means operates, during backward movement of said supporting means; and

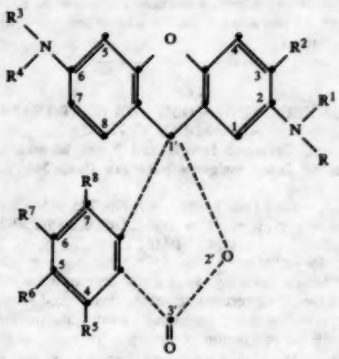
means for preventing rotation of said image bearing member in a direction opposite to the direction during the backward movement of said supporting means.

4,639,750
FLUORAN COMPOUNDS AND MARKING SYSTEMS

William M. Hung, and Edward E. Ehlinger, both of Cincinnati, Ohio, assignors to The Hilton-Davis Chemical Company, Cincinnati, Ohio

Division of Ser. No. 549,057, Nov. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 445,537, Nov. 30, 1982, Pat. No. 4,447,616. This application Feb. 24, 1986, Ser. No. 831,965
Int. Cl.[4] C07D 521/00; C09D 11/02
U.S. Cl. 346—221 23 Claims

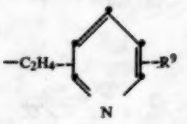
1. A 2-(N-R-N-R[1])amino-3-R[2]-6-(N-R[3]-N-R[4])amino-4'-R[5]-5'-R[6]-6'-R[7]-7'-R[8]-fluoran having the formula



wherein:

R and R[3] independently represent hydrogen, non-tertiary C_1 to C_8 alkyl, C_4 to C_8 cycloalkyl, phenyl, phenyl substituted by one or two of C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy or halo, benzyl, benzyl substituted by one or two of C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy or halo, or

in which R[9] represents hydrogen, or non-tertiary C_1 to C_4 alkyl with the proviso that at least one of R and R[3] is



R[1] represents hydrogen, non-tertiary C_1 to C_8 alkyl, formyl, non-tertiary C_2 to C_4 acyl, benzoyl, benzoyl substituted in the benzene ring by one or two of halo, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy or nitro, phenylcarbamyl, naphthylcarbamyl, phenylsulfonyl, phenylsulfonyl substituted in the benzene ring by one or two of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy or nitro, benzyl or benzyl substituted in the benzene ring by one or two of C_1 to C_3 alkyl, non-tertiary C1 to C4 alkoxy or halo;

R[2] represents hydrogen, halo or non-tertiary C_1 to C_4 alkyl;

R[4] represents hydrogen, non-tertiary C_1 to C_4 alkyl, benzyl or benzyl substituted in the benzene ring by one or two of C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy or halo;

R[3] and R[4] taken together with the nitrogen atom to which they are attached represent pyrrolidino, piperidino or morpholino;

R[5], R[6], R[7] and R[8] each independently represent hydrogen, halo, nitro or when R[5], R[8] and one of R[6] and R[7] are each hydrogen, the other of R[6] and R[7] represents COOY in which Y represents hydrogen or non-tertiary C_1 to C_{18} alkyl.

17. A pressure-sensitive carbonless duplicating system or thermal-responsive marking system comprising a support sheet coated with a layer containing as a color-forming substance a

2-(N-R-N-R[1])amino-3-R[2]-6-(N-R[3]-N-R[4])amino-4'-R[5]-5'-R[6]-6'-R[7]-7'-R[8]-fluoran according to claim 1 wherein R, R[1], R[2], R[3], R[4], R[5], R[6], R[7] and R[8] each have the same respective meanings given in claim 1.

4,639,751

IMAGE-RECEIVING SHEET FOR HEAT TRANSFER RECORDING SYSTEM

Tohru Mori; Takayasu Hongo, and Rinzo Kamikura, all of Amagasaki, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1985, Ser. No. 785,443
Claims priority, application Japan, Oct. 9, 1984, 59-211866
Int. Cl.[4] B41M *5/26*
U.S. Cl. 346—227 **5 Claims**

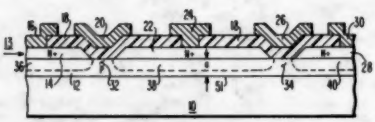
1. An image-receiving sheet for a heat transfer recording system, adapted to receive an image transferred from a heat transfer recording sheet, comprising a substrate and an image-receiving layer of coating composition thereon, said coating composition comprising non-plate-shaped inorganic pigment as the principal pigment component and a binder, said binder being at least one of the substances selected from the group consisting of oxidized starch, etherified starch, esterified starch, cationic starch, carboxymethyl cellulose, methyl cellulose, hydroxyethyl cellulose, polyvinyl alcohols, sodium salt and ammonium salt of styrene-maleic anhydride copolymer, styrene-butadiene copolymer, vinyl acetate copolymer and vinyl chloride copolymer, the smoothness under TAPPI Standard T 479 om-81 of the image-receiving surface thereof being 200 to 1,000 sec/10 ml, and the air permeability under ASTM D726 Method B of said image-receiving sheet being below 500 sec/100 ml.

4,639,752

FAST TERNARY (GAINAS) LOGIC GATE DEVICE

Walter R. Curtice, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 595,529, Mar. 30, 1984. This application Jul. 17, 1985, Ser. No. 755,828
Int. Cl.[4] H01L *29/78, 29/20*
U.S. Cl. 357—16 **10 Claims**



1. A semiconductor device comprising a substrate formed of indium phosphide (InP) having a surface, a first epitaxial layer of a semiconductor material comprising GaInAs of a first conductivity type on said substrate surface and having a surface, a first, second and third discrete region of a second conductivity type material comprising GaInAs along said first layer surface, a depletion region within said epitaxial layer between each of said three discrete regions and said substrate surface, a first and second channel region between, respectively, said first and second and said second and third discrete regions, a first, second and third electrical contact at each of said discrete regions, respectively, the thickness (a) of said first layer having values lying within the range of 0.15 micrometer and 0.33 micrometer and the dopant concentration (N) of said first layer has values lying within the range of 1.0×10^{16} cm^{-3} and 4.7×10^{16} cm^{-3}, whereby said depletion region extends completely within said first layer beneath each of said discrete regions to said substrate surface, whereby said first layer is essentially completely depleted at thermal equilibrium and whereby the capacitance between each of said adjacent discrete regions is reduced towards a minimum.

4,639,753

SEMICONDUCTOR DEVICE

Takahiro Yamada, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 19, 1985, Ser. No. 725,353
Claims priority, application Japan, Apr. 19, 1984, 59-78865; May 31, 1984, 59-111158; Jul. 18, 1984, 59-148828; Aug. 28, 1984, 59-179749
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 **11 Claims**

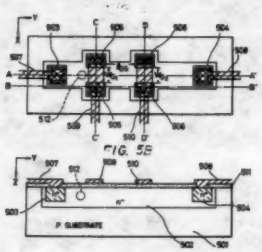


FIG. 5B

1. A semiconductor device comprising:
(a) a source region of a first conductivity;
(b) a drain region of said first conductivity;
(c) a semiconductor region of said first conductivity for forming a channel functioning as a path of carriers between said source region and said drain region;
(d) a substrate region of a second conductivity surrounding said semiconductor region;
(e) a pair of first gate regions of said second conductivity formed in said semiconductor region at a location close to said source region;
a potential barrier being formed at a location in said channel close to said first gate region, various portions of the device having an impurity concentration and dimensions selected so that a series resistance r_s from said source region to said potential barrier is less than the reciprocal of the transconductance gm of the device,
said potential barrier being formed by the depletion layer extending into said semiconductor region from said first gate region even when no voltage is applied to said first gate regions; and
(f) a pair of second gate regions of said second conductivity formed in said semiconductor region at a location close to said first gate regions, the dimension of various portions of the device so

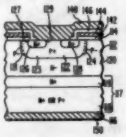
$$l_{GG} > W_{G2} > \Delta l_n + \Delta l_p$$

wherein l_{GG} is the shortest distance between said first and second gate regions;
W_{G2} is the shortest channel width determined by said second gate regions;
Δl_n is the shortest distance between said gate regions and said substrate region; and
Δl_p is the depletion layer width of said substrate region extending from said semiconductor region;
said second gate regions functioning as an electric shielding electrode to make said first gate regions free from the voltage of said drain region.

4,639,754
VERTICAL MOSFET WITH DIMINISHED BIPOLAR EFFECTS

Carl F. Wheatley, Jr., Butler Township, Luzerne County; John M. S. Neilson, Lower Providence Twsp, Montgomery County, both of Pa., and John P. Russell, Hopewell Township, Mercer County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 25, 1985, Ser. No. 705,371
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.4 7 Claims



1. In an insulated gate field effect transistor device comprising a semiconductor wafer including a drain region of first conductivity type contiguous with a wafer surface, a body region of second conductivity type extending into the wafer from said surface so as to form a body/drain PN junction having an intercept at said surface, said body region including a body-contact portion of relatively high conductivity at said surface, a source region of first conductivity type extending into the wafer from said surface so as to form a source/body PN junction having first and second intercepts at said surface, said first intercept being spaced from said body/drain intercept so as to define a channel region in the body region at said surface, said second intercept being contiguous with said body-contact portion, and a source electrode on said wafer surface in contact with said body-contact portion and said source region, the improvement comprising:

said second intercept being relatively narowly and substantially uniformly spaced from said first intercept along most of the length of said first intercept and being significantly more widely spaced from said first intercept at one or more predetermined portions; and

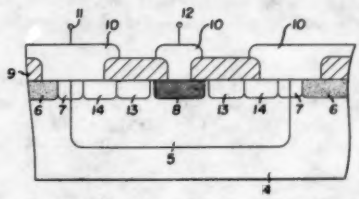
said body-contact portion including lateral extensions beneath said source region in areas corresponding to said widely spaced portions.

4,639,755
THERMOSENSITIVE SEMICONDUCTOR DEVICE USING DARLINGTON CIRCUIT

Masayuki Namiki; Masaaki Kamiya; Yoshikazu Kojima, and Kojiro Tanaka, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Aug. 31, 1982, Ser. No. 413,492
Claims priority, application Japan, Sep. 1, 1981, 56-137408
Int. Cl.[4] H01L 23/56
U.S. Cl. 357—28 6 Claims

1. A thermosensitive semiconductor device comprising: transistors connected in a Darlington connection and formed on a semiconductor substrate of one conductivity type which constitutes a common collector acting as a first collector region of each of the transistors, the semiconductor substrate having formed thereon a base region and an emitter region of each of the transistors, the base region of the first stage transistor in the Darlington connection being connected to said common collector to constitute a first terminal of the device, the emitter region of the final stage transistor of the Darlington connection constituting a second terminal of the device, and a

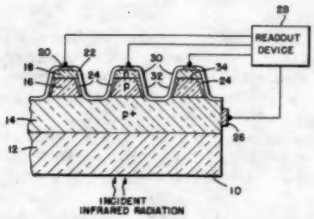


constant current source connected between the first and second terminals.

4,639,756
GRADED GAP INVERSION LAYER PHOTODIODE ARRAY

Joseph P. Rosbeck, Goleta, and Ichiro Kasai, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed May 5, 1986, Ser. No. 859,674
Int. Cl.[4] H01L 27/14, 31/12, 31/00, 29/06
U.S. Cl. 357—30 17 Claims



1. A photodiode assembly for detecting radiation incident at a bottom side of said assembly comprising:

an array of photodiodes;

a common substrate disposed at said bottom side and supporting said array of photodiodes;

a semiconducting buffer layer disposed on said substrate and extending beneath said array of photodiodes, said substrate and said buffer layer being transparent to said radiation, said substrate being an electrical insulator, said buffer layer being doped for electrical conductivity and serving as a common terminal to said photodiodes;

and wherein each of said photodiodes comprises:

a semiconductor base layer doped for electrical coonductivity, said base layer being disposed on said buffer layer for interaction with said radiation to produce electric charge carriers;

a capping layer doped with opposite electrical-conductivity dopant from said base layer to provide a p-n junction at an interface between said base layer and said capping layer, said p-n junction allowing for a flow of current of said charge carriers;

an electric terminal disposed on said capping layer;

and wherein said assembly further comprises an electrically-charged electrically-insulating passivation layer covering each of said photodiodes and extending downward through said capping layer and said base layer into said buffer layer around each photodiode to electrically isolate currents of respective ones of said photodiodes, said charged passivation layer inducing an inversion layer in said base layer in each of said photodioder ..long an interface with said passivation layer for extensi n of said p-n

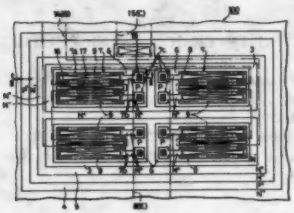
junction and increased photon collection efficiency of a photodiode, the doping of said buffer layer being sufficiently larger than the doping of said base layer to inhibit formation of the inversion layer along an interface between said passivation layer and said buffer layer.

4,639,757

POWER TRANSISTOR STRUCTURE HAVING AN EMITTER BALLAST RESISTANCE

Isao Shimizu, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,948
Claims priority, application Japan, Dec. 12, 1980, 55-174499
Int. Cl.[4] H01L *29/72, 27/02, 23/48*
U.S. Cl. 357—36 16 Claims



1. A semiconductor device including a bipolar transistor and a parasitic transistor, said semiconductor device comprising:

a first semiconductor region of a first conductivity type to serve as a collector region of said bipolar and parasitic transistors;

a second semiconductor region of a second conductivity type to serve as a base region for said bipolar and parasitic transistors, said second semiconductor region being formed adjacent to said first semiconductor region; and

a third semiconductor region of said first conductivity type to serve as an emitter region for said bipolar and parasitic transistors, said third semiconductor region being formed adjacent to said second semiconductor region,

wherein said third semiconductor region comprises an operating portion for forming the emitter of the bipolar transistor, and a ballast resistance portion and a terminal portion which form the emitter of the parasitic transistor, and further wherein said ballast resistance portion is surrounded by said second semiconductor region and the effective base width of said parasitic transistor is greater than the base width of the bipolar transistor base region in the base region portion of said parasitic transistor adjacent to said terminal portion of said third semiconductor layer to reduce a current gain of the parasitic transistor, and

wherein said semiconductor device further comprises a base contact portion formed in said second semiconductor region to extend adjacent to said operating portion of said emitter region of said bipolar transistor but not extending adjacent to said ballast resistance portion and said terminal portion, an emitter input terminal electrode formed to contact said emitter terminal portion, a metal contact stripe formed to contact said emitter operating portion and spaced from said emitter input terminal electrode, a base input terminal electrode formed to contact said base contact region along said metal contact stripe so that said emitter input terminal electrode and said base input terminal electrode are spaced apart from one another, and

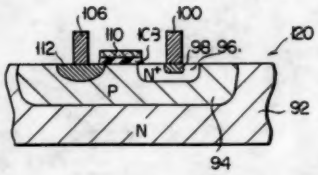
wherein an emitter-base junction located between said emitter terminal portion and said base region is located more closely adjacent to said emitter terminal portion than to said base contact region.

4,639,758

METAL OXIDE SEMICONDUCTOR FIELD-EFFECT TRANSISTOR WITH METAL SOURCE MAKING OHMIC CONTACT TO CHANNEL-BASE REGION

Tetsuya Iizuka, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 211,929, Dec. 1, 1980, abandoned. This application Aug. 23, 1983, Ser. No. 525,707
Claims priority, application Japan, Dec. 7, 1979, 54-157967
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—42 3 Claims



1. A memory cell with metal oxide semiconductor field-effect transistors comprising:

a first semiconductor layer of a first conductivity type;

first and second MOS transistors formed in said first semiconductor layer, each having one conductivity type channel and having a source region, drain region and gate electrode, source regions of said first and second MOS transistors receiving a first power source voltage;

a second semiconductor layer of a second conductivity type;

third and fourth MOS transistors formed in said second semiconductor layer, each having the opposite conductivity type channel and having a drain region, gate electrode and means for providing an inversion layer carrier source consisting essentially of a metal diffusion region, formed in said second semiconductor layer in ohmic contact with said second semiconductor layer, wherein (i) current flows in a first direction between said metal diffusion region and said drain of each of said third and fourth MOS transistors through an inversion layer which is induced in the surface of said second semiconductor layer under said gate electrode of each of said third and fourth MOS transistors and which is coupled to the associated metal diffusion region when a first polarity voltage is applied to the associated gage electrode, and (ii) a current flows in a second, opposite direction between said metal diffusion region of each of said third and fourth MOS transistors and said second semiconductor layer, and a p-n junction between said second semiconductor layer and said drain region of each of said third and fourth MOS transistors is reverse biased when a second polarity voltage is applied to the associated gate electrode;

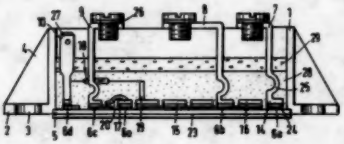
the drain region of said third MOS transistor being connected to the drain region of said first MOS transistor, the drain region of said fourth MOS transistor being connected to the drain region of said second MOS transistor, the gates of said first and third MOS transistors being connected to each other and also connected to a node between the drains of said second and fourth MOS transistors, the gate of said second and fourth MOS transistors being connected to each other and also connected to a node between the drains of said first and third MOS transistors; and

means for supplying said second semiconductor layer with a second power source voltage to permit said second power source voltage to be supplied to said metal diffusion region of said third and fourth MOS transistors.

4,639,759
POWER TRANSISTOR MODULE

Arno Neidig, Plankstadt; Bernd Lenkel, Weinheim, and Lutz Bergmann, Lampertheim, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie., AG, Mannheim, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 550,910
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241509
Int. Cl.[4] H01L *23/02*; H02G *13/08*
U.S. Cl. 357—74 4 Claims

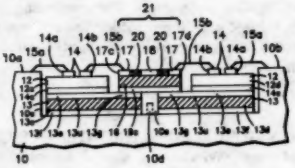


1. Power transistor module, comprising a housing having a frame forming a housing wall and a ceramic plate fastened to said frame forming a housing bottom; structured metallizations disposed on said ceramic plate forming conductor runs and terminal pads; components including at least one power transistor having a collector electrode and a bypass diode connected to said terminal pads; wiring elements being connected to said components and being freely accessible from the top of said housing, said wiring elements including an auxiliary collector terminal; and an auxiliary diode connected between said auxiliary collector terminal and the collector electrode of said power transistor.

4,639,760
HIGH POWER RF TRANSISTOR ASSEMBLY

Helge O. Granberg, Phoenix, and Samuel L. Coffman, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 21, 1986, Ser. No. 820,773
Int. Cl.[4] H01L *25/04, 23/14, 23/02, 23/06*
U.S. Cl. 357—75 4 Claims

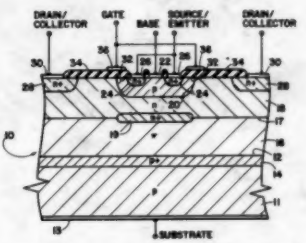


1. A high power, high frequency transistor unit, comprising:
an electrically and thermally conductive base plate having a centerline;
at least two separate electrically insulating but thermally conducting isolators disposed in either side of said centerline, each having a first principal face bonded to said base plate and a second principal face opposite said first principal face, wherein said second principal face has thereon a first metal layer;
at least two transistor die, each having a signal input contact, a reference contact, and a power output contact, wherein said signal input contact and said reference contact are on a first face of said transistor die and said power output contact is on an opposed second face of said transistor die, and wherein said at least two transistor die are disposed on said isolators, one per isolator, with said power output contact bonded to said first metal layer of said isolator;
a ballasted electrical input-output assembly comprising a substantially flat electrically insulating plate having first and second opposed principal faces, wherein said insulating plate extends over and parallel to said centerline and portions of said at least two isolators and bridges between at least two of said at least two isolators located on either side of said centerline;
wherein said insulating plate has on said first face a first metal region region forming an input lead for said assembly and at least two ballast resistor regions, one per transistor, each ballast resistor region being located between said input lead and a second metal region coupled to said input contact of one of said transistors;
wherein said insulating plate has on said second face an output conductor electrically coupled to said output contacts of said transistors die by said first metal layers on said isolators, and wherein said output conductor extends around an edge of said insulating plate onto said first surface; and
first wire bonds extending from said input lead to an external input lead of said assembly, second wire bonds extending from said output lead to an external output lead of said assembly, third wire bonds extending from said reference contacts of said transistor die to said substrate, and fourth wire bonds extending from said second metal regions on said insulating plate to said input contacts of said transistor die.

4,639,761
COMBINED BIPOLAR-FIELD EFFECT TRANSISTOR RESURF DEVICES

Barry M. Singer, New York, N.Y., and Rajsekhar Jayaraman, Cambridge, Mass., assignors to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 562,145, Dec. 16, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 792,221
Int. Cl.[4] H01L *27/02, 29/78, 29/90, 29/00*
U.S. Cl. 357—234 8 Claims



1. A combined bipolar-field effect transistor RESURF device, which comprises;
a semiconductor substrate of a first conductivity type and having a major surface and a substrate electrode connected to the side of said substrate opposite said major surface;
a lightly-doped epitaxial buried layer of said first conductivity type on said major surface of the substrate and having a doping level at least an order of magnitude less than that of said substrate;
an epitaxial surface layer of a second conductivity type opposite to that of said first on said buried epitaxial layer, the doping concentration and thickness of said epitaxial surface layer being selected in accordance with the REduced SURface Field (RESURF) technique such that the product of doping concentration and epitaxial layer thickness ($N_{epi} \times d_{epi}$) is about 10^{12} atoms/cm^2;
a surface-adjoining base region of said first conductivity type in said epitaxial surface layer;
a base electrode connected to said base region;

a highly-doped buried region of said second conductivity type located beneath said base region and sandwiched between said epitaxial buried layer and said epitaxial surface layer;

a surface-adjoining source/emitter region of said second conductivity type in said base region, the source/emitter region serving both as the source and the emitter of said combined device;

a source/emitter electrode connected to said source/emitter region;

a surface-adjoining drain/collector region of said second conductivity type in said epitaxial surface layer and spaced apart from said base region, the drain/collector region serving as both the drain and the collector of said combined device;

a drain/collector electrode connected to said drain/collector region;

a surface-adjoining channel region at least partly in a peripheral portion of said base region which is nearest said drain/collector region;

an insulating layer on said surface layer and covering at least that part of said channel region which is in said base region; and

a gate electrode on said insulating layer and over at least that part of said channel region which is in said base region.

4,639,762

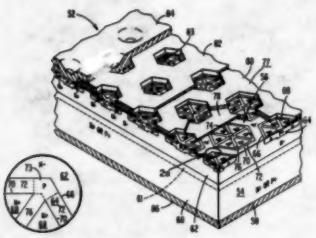
MOSFET WITH REDUCED BIPOLAR EFFECTS

John M. S. Neilson, Norristown, Pa., and Norbert W. Brackelmanns, Ironia, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1984, Ser. No. 605,427

Int. Cl.[4] H01L *29/78, 29/06*

U.S. Cl. 357—23.8 **12 Claims**



1. An IGFET device comprising:

a semiconductor wafer including a drain region of first conductivity type contiguous with a wafer surface;

a diffused body region of second conductivity type extending into the wafer from said wafer surface so as to form a body/drain PN junction having an intercept at said surface, said intercept having a substantially polygonal shape;

a plurality of source regions of first conductivity type extending into the wafer from said surface within the boundary of the body region, each source region forming a source/body PN junction which is spaced from said body/drain PN junction so as to define a channel region in the body region at said surface, and each of the source/-body PN junctions being spaced from each other so as to define, in the body region, at the wafer surface, a contact area and at least one shunt region, each shunt region extending from said contact area to a corner of said polygonally-shaped body/drain PN junction intercept; and

a source electrode which contacts said body region contact area and each of the shunt regions and source regions adjacent thereto.

4,639,763

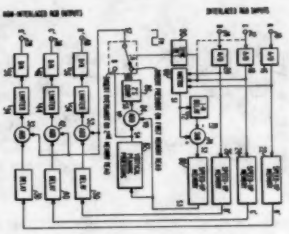
INTERLACE TO NON-INTERLACE SCAN CONVERTER FOR RGB FORMAT VIDEO INPUT SIGNALS

Donald H. Willis, Marion County, and Russell T. Fling, Fishers, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1985, Ser. No. 729,014

Int. Cl.[4] H04N *9/77*

U.S. Cl. 358—11 **9 Claims**



1. Interlaced to non-interlaced scan conversion apparatus, comprising:

input means for receiving first, second and third color component signals representative of an image raster scanned in interlaced fashion at a given horizontal line rate;

video speed-up circuit means, coupled to said input means, for providing first, second and third double line rate color component video ouput signals;

vertical detail signal forming means, coupled to a selected one of said input means and said speed-up circuit means, for providing a double line-rate vertical detail representative signal;

processing means, coupled to said vertical detail signal forming means, for providing a double line rate vertical peaking signal; and

output means, having a first operative condition for combining said vertical peaking and detail signals with every other line of said double line-rate video output signals for causing said other lines to exhibit preshoot and having a second operative condition for combining said vertical peaking signal with intermediate lines of said double line-rate video output signals for causing the intermediate lines to exhibit overshoot.

4,639,764

MAC VERTICAL SYNCHRONIZING SIGNALS

Richard Morcom, Winchester, United Kingdom, assignor to Independent Broadcasting Authority, London, United Kingdom

PCT No. PCT/GB83/00186, § 371 Date Mar. 23, 1984, § 102(e) Date Mar. 23, 1984, PCT Pub. No. WO84/00657, PCT Pub. Date Feb. 16, 1984

PCT Filed Jul. 29, 1983, Ser. No. 598,326

Claims priority, application United Kingdom, Jul. 30, 1982, 8222055

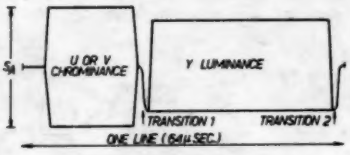
Int. Cl.[4] H04N *5/04*

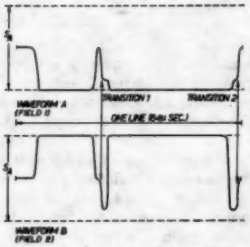
U.S. Cl. 358—14 **10 Claims**

2. A transmission system for transmitting television signals of the type including separate chrominance and luminance components within individual line periods, the system comprising means for separating the chrominance and luminance components from a picture signal to provide line scan periods having said separated components, means for inserting a vertical synchronisation signal within each field of television signals, said vertical synchronisation signal having a duration of one line period and an amplitude component greater than that

of a corresponding component of the separated picture signal, the luminance component of the television signal has an amplitude limit less than that of the chrominance component, the vertical synchronisation signal inserting means generates a signal having a component corresponding to the luminance component but with a greater amplitude, and the amplitude of said vertical synchronisation signal component corresponding to the luminance component has an amplitude equal to that of the amplitude limit of the chrominance component.

5. A transmission system for transmitting television signals of the type including separate chrominance and luminance components within individual line periods, the system comprising means for separating the chrominance and luminance components from a picture signal to provide line scan periods having said separated components, means for inserting a vertical synchronisation signal within each field of television signals, said vertical synchronisation signal having a duration of one line period and an amplitude component greater than that of a corresponding component of the separated picture signal, the picture signal includes transitions between the chrominance and luminance components for horizontal synchronisation information, and said vertical synchronisation signal inserting means provides similar transitions in the vertical synchronisation signal, so as to accelerate horizontal synchronisation.





4,639,765

SYNCHRONIZATION SYSTEM FOR OVERLAY OF AN INTERNAL VIDEO SIGNAL UPON AN EXTERNAL VIDEO SIGNAL

Lodewijk J. D'Hont, Zwolle, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 28, 1985, Ser. No. 706,690
Int. Cl.[4] H04N 9/455
U.S. Cl. 358—19 **20 Claims**

1. A video signal mixing system comprising:

an input means for receiving an external composite video signal:

a horizontal synchronization pulse detecting means connected to said input means for detecting the horizontal synchronization pulses of said first composite video signal;

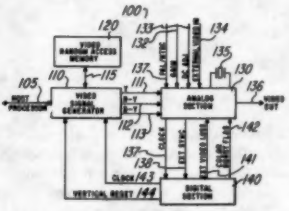
an external signal loss detector connected to said input means for detecting and indicting the loss for longer than a first predetermined period of time greater than the period of said horizontal synchronization pulses the loss of said external composite video signal;

a video clock frequency standard for determining a frequency;

a video clock signal generating means connected to said horizontal synchronization pulse detecting means and said external signal loss detector for generating a video clock signal, said video clock signal generating means having

a horizontal phase lock loop means connected to said horizontal synchronization pulse detecting means including a horizontal controlled oscillator for generating internal horizontal synchronization pulses in phase synchronization with said detected horizontal synchronization pulses, and

a video clock phase lock loop means connected to said horizontal phase lock loop means and said video clock frequency standard including a video clock controlled oscillator for generating said video clock signal having a frequency corresponding to and corrected by the frequency of said internal horizontal synchronization pulses when said external signal loss detector does not indicate the loss of said external composite video signal and having a frequency corresponding to said frequency determined by said video frequency standard when said external signal loss detector indicates loss of said external composite video signal, whereby momentary loss of said external composite video signal for a time less than said predetermined period of time causes said frequency of said video clock signal to be controlled by said horizontal controlled oscillator;



a video signal generating means connected to said video clock signal generating means for generating an internal composite video signal in synchronization with said video clock signal thereby generating said internal composite video signal having horizontal lines in synchronism with said detected horizontal synchronization pulses; and

a video switching means connected to said input means, said external signal loss detector and said video signal generating means having an output means for selectively connecting either said external composite video signal or said internal composite video signal to said output means, said video switching means selecting said internal composite video signal when said external signal loss detector indicates loss of said external composite video signal, whereby said output means receives a combined video signal having synchronized horizontal lines.

4,639,766

PHASE AND AMPLITUDE CONTROL OF VERTICAL MODULATION IN HORIZONTAL SCAN OF CRT HIGH RESOLUTION TELEVISION

Jonathan M. Schine, Los Angeles, Calif., assignor to High Resolution Television, Inc., Los Angeles, Calif.

Filed Oct. 2, 1984, Ser. No. 656,864
Int. Cl.[4] H04N 9/00
U.S. Cl. 358—21 R **6 Claims**

1. In a system having means for producing video signals for display with vertical deflection of the horizontal scan modulated at twice the color subcarrier frequency for greater verti-

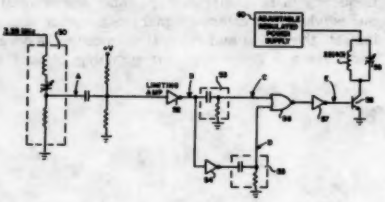
cal resolution of information to be displayed on a display unit having vertical deflection coil of the horizontal scan to be modulated in synchronism with vertical modulation at the video signal source,

a capacitor connected in parallel with an inductor to form an LC resonant circuit tuned to twice said color subcarrier frequency,

a local oscillator at the display site for producing a sinusoidal signal synchronized in frequency and phase with said color subcarrier frequency,

means for adjusting the phase of said sinusoidal signal and producing a square waveform signal from said sinusoidal signal,

means for differentiating said square waveform with an RC circuit having a time constant selected to cause the decaying waveform cross a predetermined threshold level of a particular polarity in a period substantially equal to one quarter period of said color subcarrier frequency,



means for inverting said square waveform,

means for differentiating said inverted square waveform with an RC circuit having a time constant selected to cause the decaying waveform cross a predetermined threshold level of said particular polarity in a period substantially equal to one quarter period of said color subcarrier frequency,

means responsive to the decaying waveforms of both differentiated square waveforms to produce a signal train of pulses, each pulse being produced from said decaying waveforms while they exceed said threshold, thereby generating a square waveform at a frequency that is twice said color subcarrier frequency, and

an active switching element connected to conduct current through said deflection coil in response to each pulse in said train, said LC resonant circuit as a load.

4,639,767

APPARATUS FOR DETECTING MOVEMENT IN A TELEVISION SIGNAL BASED ON TAKING RATIO OF SIGNAL REPRESENTING FRAME DIFFERENCE TO SIGNAL REPRESENTING SUM OF PICTURE ELEMENT DIFFERENCES

Norio Suzuki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 7, 1984, Ser. No. 648,984

Claims priority, application Japan, Sep. 8, 1983, 58-165447; Nov. 15, 1983, 58-214541

Int. Cl.[4] H04N 9/64

U.S. Cl. 358—21 R **12 Claims**

7. A movement detecting apparatus for detecting the degree of movement of an image which is represented by a composite television signal having a brightness signal component and a chrominance signal component, said apparatus comprising:

means for producing a frame difference signal having a magnitude which is related to the difference between a present and previous television signal;

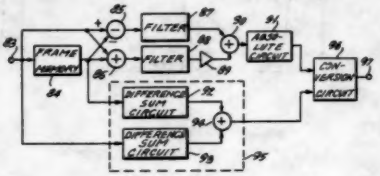
means for obtaining a high frequency component signal from said composite television signal; and

means for producing an output which is indicative of the degree of movement of said image, said output being proportional to said frame difference signal and being scaled by said high frequency component signal;

said means for producing said frame difference signal including first means for producing a first frame difference signal based on said brightness signal component, a second means for producing a second frame difference signal based on said chrominance signal component, and an addition circuit for combining said first and second frame difference signals.

9. A movement detecting apparatus for detecting the degree of movement of an image which is represented by a composite television signal having a brightness signal component and a chrominance signal component, said apparatus comprising:

means for producing a frame difference signal having a magnitude which is related to the difference between a present and previous television signal;



means for obtaining a high frequency component signal from said composite television signal; and

means for producing an output which is indicative of the degree of movement of said image, said output being proportional to said frame difference signal and being scaled by said high frequency component signal;

said means for obtaining a high frequency component signal comprising a first one sample delay element; a subtraction circuit connected to said first one sample delay circuit and to said television signal; a two sample delay circuit connected to said subtraction circuit; a first addition circuit connected to said two sample delay circuit and to said subtraction circuit; an absolute value circuit connected to said first addition circuit; a second one sample delay circuit connected to said absolute value circuit; and a second addition circuit connected to said second one sample delay circuit and to said absolute value circuit.

4,639,768

VIDEO SIGNAL SUPERIMPOSING DEVICE

Atsushi Ueno, and Takao Abumi, both of Yaita, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 1, 1984, Ser. No. 656,757

Claims priority, application Japan, Oct. 3, 1983, 58-185755

Int. Cl.[4] H04N 9/74

U.S. Cl. 358—22 **9 Claims**

1. A video signal superimposing device for superimposing and displaying video signals produced from at least two systems comprising:

first input means for inputting a color complex video signal;

means for producing a burst signal from said color complex video signal;

separation means for separating a first brightness signal and a first chroma signal from the color complex video signal;

second input means for inputting R.G.B. signals;

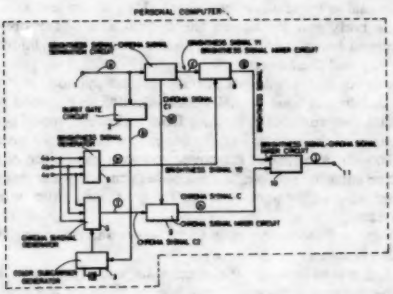
first generation means for generating a second brightness signal from said R.G.B. signals;

first mixer means for mixing the second brightness signal and the first brightness signal separated by the separation means to form a mixed brightness signal;

second generation means responsive to said burst signal for generating a second chroma signal from said R.G.B. signals;

second mixer means for mixing the second chroma signal

and the first chroma signal separated by the separation means to form a mixed chroma signal; and



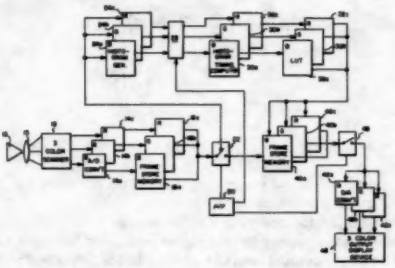
third mixer means for mixing the mixed brightness signal applied from the first mixer means and the mixed chroma signal applied to the second mixer means to form a combined signal.

4,639,769

MODIFYING COLOR DIGITAL IMAGES

Richard B. Fleisher, Pittsford, and Bruce A. Rubin, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,317
Int. Cl.[4] H04N 9/73
U.S. Cl. 358—27 3 Claims



1. Apparatus for modifying the brightness levels of three digital color images which have a predetermined number of discrete brightness levels respectively to make them compatible with an output display device which has a number of available discrete brightness levels, comprising:

(a) means responsive to the color digital images for forming three separate histograms; and

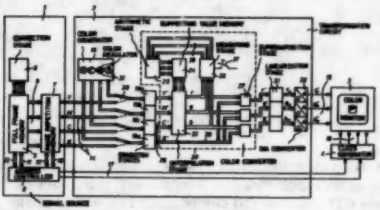
(b) means responsive to each histogram for producing a transform function that operates upon its color digital image pixels to modify their brightness levels so that predetermined numbers of the brightest and darkest pixels are respectively assigned to the brightest and darkest level of the output display device and the remaining digital image pixels are assigned to their corresponding remaining output display device brightness levels, whereby an improved output image is produced by the display device.

4,639,770

METHOD AND CIRCUIT ARRANGEMENT FOR SIMULATING A MULTI-COLORED REPRODUCTION ON A COLOR MONITOR

Eggert Jung, Schoenberg, and Siegfried Klopsch, Probsteierhagen, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Dec. 19, 1984, Ser. No. 683,803
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3347049
Int. Cl.[4] H04N 1/46
U.S. Cl. 358—76 17 Claims



1. An arrangement for isochromatic simulation of a multi-colored reproduction on a color monitor, comprising:

(a) signal source means for outputting color separation values Y,M,C,K of a multi-colored reproduction;

(b) transformer stage means connected to said signal source means for transformation of said color separation values Y,M,C,K into color monitor video drive values required for the isochromatic simulation;

(c) a color monitor means connected to receive said video drive values;

(d) said transformer stage means comprising

(i) gradation stage means connected to said signal source means for changing the color separation values Y,M,C,K output by said signal source means according to a reproduction gradation curve dependent on the later to occur reproduction process;

(ii) an arithmetic stage means for calculation of color value triads r,g,b for a supporting point network of a reproduction color space;

(iii) a supporting value memory means connected to said arithmetic stage means for deposit of the calculated color value triads of the supporting point network;

(iv) an interpolation stage means communicating with said gradation stage means, arithmetic stage means, and supporting value memory means for interpolation of color value triads r,g,b from color value triads r_n,b_n, g_n of said supporting point network dependent on altered color separation values Y', M', C' of the three chromatic color separations of the multi-colored reproduction;

(v) logic stage means communicating with said interpolation stage means and gradation stage means for formation of corrected color value triads r', g', b' from the color value triads r,g,b and from color separation values K' of a black separation;

(vi) linearization stage means connected to said logic stage means for generating linearized color value triads r_n, g_n, b_n from the color value triads r,g,b according to the radiation density characteristics of the color monitor means; and

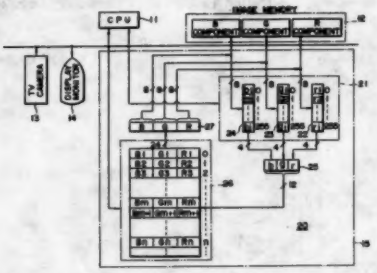
(vii) analog-to-digital converter means communicating with the linearization stage means for generating video drive values r'$_n$, g'$_n$, b'$_n$ from the linearized color value triads r_n, g_n, b_n.

4,639,771

IMAGE PROCESSING SYSTEM

Yoshihisa Hattori, and Nobuo Inoue, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 30, 1985, Ser. No. 792,867
Claims priority, application Japan, Oct. 31, 1984, 59-227913
Int. Cl.[4] H04N 1/46, 9/74
U.S. Cl. 358—80 3 Claims



1. An image processing system having an image memory for storing an input image as first density pixel data of red (R), green (G) and blue (B) components to perform image display in accordance with storage contents of said image memory, comprising:

a density conversion table memory addressed by the first density pixel data read out from said image memory, to generate second density pixel data predetermined as representative density pixel data of the first density pixel data;

a color conversion table memory addressed by the second density pixel data read out from said density conversion table memory, to generate color density pixel data prepared for color display in advance; and

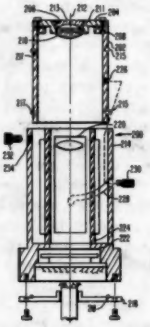
means for writing in said image memory the color density pixel data read out from said color conversion table memory.

4,639,772

FOCUSABLE VIDEO CAMERA FOR USE WITH ENDOSCOPES

Erik Sluyter, Santa Barbara, and Edward A. Wooff, Jr., Ventura, both of Calif., assignors to Circon Corporation, Santa Barbara, Calif.

Filed Feb. 7, 1984, Ser. No. 578,274
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—98 3 Claims



1. A highly compact focusable video camera for use in medical and surgical procedures in conjunction with an endoscope comprising:

a cylindrical body defining a containment space having an open input end;

a cover having an apertured top portion and a cylindrical sleeve, the sleeve portion extending into the containment space in close fit to the cylindrical body portion;

an optical system, a portion thereof being mounted in the cover for receiving optical imagery through the optical aperture in the cover, and a portion thereof being mounted in the cylindrical body, the optical system being focusable by relative movement along its optical axis, of the body and the cover, the optical axis of the optical system being coextensive with the axis of the cylindrical body and the cover;

a groove in the internal surface of the cylindrical body extending at least partially thereinto defining spaced parallel cam surfaces extending from a predetermined point closer to the aperture of the cover to a point more distant from the aperture of the cover, the total axial pitch of the cam surfaces relative to the optical axis being the desired focusing adjustment between the portions of the optical system;

a follower fixed to the cylindrical sleeve and extending into the groove;

sealing means between the interior surface of the body and the external surface of the sleeve for blocking the passage of fluid into the containment space;

means inside the containment space for sensing and converting the optical imagery transmitted to it by the lens system, into unprocessed electronic video signals; and

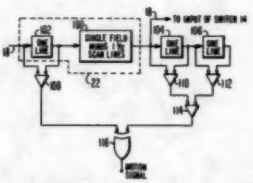
means for receiving the unprocessed electronic video signals and for preprocessing said signals and for transmitting said signals outside the body.

4,639,773

APPARATUS FOR DETECTING MOTION IN A VIDEO IMAGE BY COMPARISON OF A VIDEO LINE VALUE WITH AN INTERPOLATED VALUE

Robert N. Hurst, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 601,365, Apr. 17, 1984, abandoned, which is a continuation of Ser. No. 226,712, Jan. 21, 1981, abandoned.
This application Nov. 20, 1985, Ser. No. 799,858
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—105 7 Claims



1. In a video signal processing apparatus; circuitry for detecting image motion comprising:

a signal input for applying a video signal;

delay means coupled to said signal input and having a first plurality including one, of signal paths for providing video signals from a first field of the video signal, and having a second plurality, including at least two, of signals paths for providing at least two video signals from a second field of the video signal different from said first field wherein the video signals from said first and second fields are separated by substantially an odd integral number, including one, of field intervals and said at least two video signals are separated from each other by an integral number, including one, of horizontal line intervals;

first conbining means coupled to said second plurality of signal paths for summing said at least two video signals, to produce a video signal representing approximately like spatial image points as said video signal from said first field;

means, including means coupled to said first plurality of signal paths and said first combining means for comparing video signals from said first plurality of signal paths with video signals from said first combining means and generating a motion indicating signal having a first state when

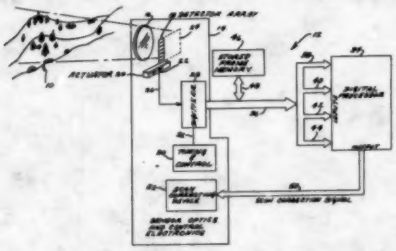
video signals from said first and second fields differ, and having a second state otherwise.

4,639,774

MOVING TARGET INDICATION SYSTEM

David L. Fried, Placentia, Calif., assignor to D. L. Fried Associates, Inc., Placentia, Calif.

Filed Jun. 21, 1985, Ser. No. 747,972
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—105 16 Claims



1. In a moving target indication system wherein a field of view is repeatedly scanned with detection means, the combination of,

means for developing and storing information of said field of view from a first scan,

means for developing later information of said field of view from a succeeding scan,

means for comparing said later information with said stored information from said first scan, and to indicate any difference therebetween,

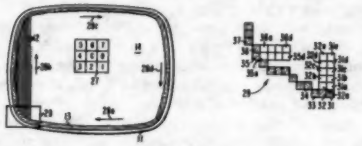
and means for effecting adjustment of said later information to compensate for any misalignment of said succeeding scan as compared to said first scan.

4,639,775

METHOD FOR DETECTING BLEMISHES NEAR THE PERIMETER OF A CCD IMAGE

Edward Cohen, Lancaster; Clarence M. Weaver, Jr., Reamstown, and Robert A. Duschl, Lancaster, all of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed May 17, 1985, Ser. No. 735,054
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—106 19 Claims



1. A method for detecting blemishes near the perimeter of a CCD (charge coupled device) image, wherein said perimeter is identified by perimeter identifying CCD pixels, and wherein said perimeter identifying pixels are sequentially considered in a selected direction around said perimeter, said method comprising the steps of:

detecting the charge levels of perimeter identifying pixels in a sequence of pixel motions, wherein a pixel motion is the detection of adjacent pixel charge levels and wherein adjacent pixels are pixels having contiguous sides or contiguous corners, said pixel motions being taken in directions defined by a pixel direction matrix wherein the pixel being detected is surrounded by adjacent pixels whereby the detection of side adjacent pixels results in straight pixel motions and the detection or corner adjacent pixels results in diagonal pixel motions, and whereby blemish detection motions are motions normal to said straight pixel motions toward the center of said CCD image;

sequentially detecting the charge levels on adjacent perimeter identifying pixels to detect straight and diagonal pixel motions;

taking blemish detection motions from each of said adjacent perimeter identifying pixels while considering a plurality of pixels along said blemish detection motions; and

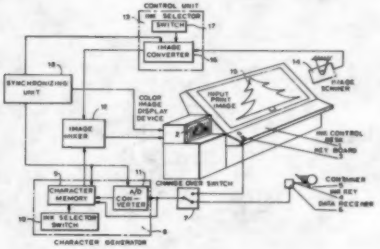
comparing a first portion of said plurality of pixels with a second portion of said pixels and providing a blemish signal when the comparison is outside a selected variance.

4,639,776

INDICATING DEVICE FOR A PRINTING MACHINE FOR SUPERIMPOSING INK KEY SETTING VALUES ON AN IMAGE TO BE PRINTED

Karl-Heinz Foerster, Dresden, and Siegfried Koerner, Coswig, both of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Oct. 26, 1983, Ser. No. 545,740
Claims priority, application German Democratic Rep., Oct. 26, 1982, 244262
Int. Cl.[4] H04N 7/18; B41F 31/02
U.S. Cl. 358—107 7 Claims



1. An indicating device for a printing machine having ink keys, comprising: displaying means; means for scanning an input print image to be printed and producing signals corresponding to the scanned image; means for producing digital signals corresponding to desired or actual setting values for ink keys; means for mixing the signals corresponding to the scanned image and the digital signals; and means for simultaneously transmitting the mixed signals to the displaying means to display thereon the desired or actual setting values superimposed over the input print image to be printed.

4,639,777

APPARATUS FOR SCRAMBLING AND DESCRAMBLING COMMUNICATION SIGNALS

Hitoshi Mori, Kobe, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

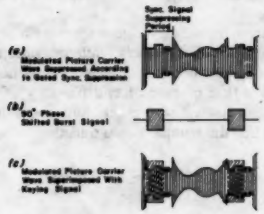
Filed Dec. 13, 1984, Ser. No. 681,368
Claims priority, application Japan, Dec. 16, 1983, 58-238103
Int. Cl.[4] H04N 7/167; H04K 1/02
U.S. Cl. 358—120 7 Claims

1. A method of scrambling a communication signal comprising the steps of:

(a) compressing a synchronizing signal component of a picture carrier wave which has been amplitude-modulated by a video signal; and

(b) superimposing a keying signal, indicative of the period

during which said synchronizing signal is compressed, on said picture carrier wave within or preceding said period,



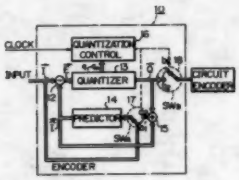
said keying signal being a carrier wave shifted 90° in phase from said picture carrier wave.

4,639,778

EMBEDDING QUANTIZATION SYSTEM FOR VECTOR SIGNALS

Hirohisa Yamaguchi, and Kazuo Yamada, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,679
Claims priority, application Japan, Jul. 28, 1983, 58-136697
Int. Cl.⁴ H04N 7/13
U.S. Cl. 358—135 **7 Claims**



1. In an embedding quantization system of a vector signal comprising:

an input terminal for receiving a sampled input signal;

a quantizer;

a predictor having an input coupled to the output of said quantizer;

a subtractor for providing the difference between the input signal and the output of said predictor, to said quantizer;

wherein the input signal applied to said input terminal is a vector signal which is subject to quantization;

an adder means for providing a sum of the output of said quantizer and the output of said predictor, to the input of said predictor, wherein a prediction by said predictor and a quantization by said quantizer are input of said predictor, wherein a prediction by said predictor and a quantization by said quantizer are accomplished a plurality of times by feeding back the output of said predictor to the input of said predictor through said adder means to provide a plurality of quantized output signals;

a quantization control means;

a first switch for switching the input of said predictor wherein the input signal is applied to said predictor at a first clock period for the embedding quantization operation, and the output of said adder is applied to the predictor at other clock periods controlled by said quantization control means; and

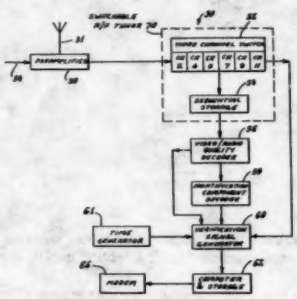
a second switch, coupled to the output of said quantizer, for providing quantized output signals to an external circuit under the control of said quantization control means.

4,639,779

METHOD AND APPARATUS FOR THE AUTOMATIC IDENTIFICATION AND VERIFICATION OF TELEVISION BROADCAST PROGRAMS

Burton L. Greenberg, 28 E. 10th St., New York, N.Y. 10003

Continuation of Ser. No. 476,915, Mar. 21, 1983, Pat. No. 4,547,804. This application Oct. 15, 1985, Ser. No. 786,983
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.
Int. Cl.⁴ H04N 7/087, 7/08, 7/00
U.S. Cl. 358—142 **11 Claims**



1. A method for automatically identifying and verifying the proper airing of a television program which has an identification code recorded on a selected line of each frame of the program and which is transmitted as a composite signal from one or more sending stations at one or more times over one or more channels for reception in a receiving area, comprising the steps of:

(a) storing reference signals in a first memory means, each of said reference signals containing information referenced to said identification code specifying a bought airing of the program identified thereby;

(b) receiving each of the composite signals of said channels;

(c) automatically scanning said channels to detect the presence of said identification code and of a proper audio and video portion of each received composite signal which includes said identification code;

(d) separating the detected identification code from each of said received composite signals;

(e) generating an electrical time signal;

(f) generating a channel identifying signal;

(g) forming with said time signal and said channel identifying signal a separate verification signal for each separated identification code, said verification signal including information specifying said separated identification code and the time and channel of receiving said program;

(h) storing each said verification signal in a second memory means to identify a verified airing of said program; and

(i) comparing verified airings information from said second memory means with bought airings information from said first memory means and making therefrom a list of the number of verified airings that were bought airings and the number of bought airings for which there is no verified airing.

4,639,780

TELEVISION SYNCHRONIZING APPARATUS

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 1, 1985, Ser. No. 718,365
Int. Cl.⁴ H04N 5/06
U.S. Cl. 358—150 **25 Claims**

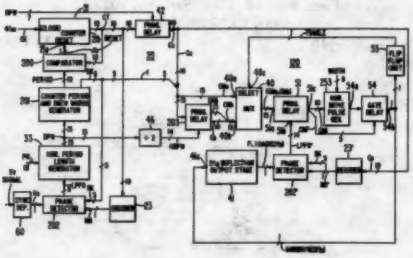
1. A television apparatus for generating from a periodic, scanning frequency, synchronizing input signal, an output

signal that is periodic at a frequency greater than said scanning frequency, comprising:

a source of said synchronizing input signal;

means responsive to said input signal for developing a part length signal that is indicative of the length of a part period of said synchronizing input signal;

means responsive to said synchronizing input signal for generating a first periodic signal;



means responsive to said part length signal for time shifting said first periodic signal by an amount that is determined in accordance with said length to generate a second periodic signal; and

means responsive to said first and second periodic signals for generating said output signal therefrom.

4,639,781

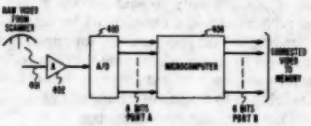
DYNAMIC GAIN ADJUSTER FOR AN IMAGE SCANNER

Norman M. Rucci, Howell, and Helmuth O. Sautter, Middletown, both of N.J., assignors to AT&T Information Systems, Murray Hill, N.J.

Filed Feb. 19, 1985, Ser. No. 703,235

Int. Cl.[4] H04N *5/14, 3/14, 1/40*

U.S. Cl. 358—163 **12 Claims**



1. A method of compensating for sensitivity variations in an image sensing device, the method comprising the steps of:

receiving an input signal in a plurality of scanned lines from the image sensing device, the input signal being reflective of an image for display;

determining instantaneous signal amplitude levels in the input signal, each instantaneous signal amplitude level being indicative of a particular section of the image on a scan line;

storing in memory a plurality of the instantaneous signal amplitude levels;

comparing first and second instantaneous signal amplitude levels on adjacent scan lines for generating a corrective factor signal, the comparing step including comparing the second instantaneous signal amplitude level with the previously received and juxtaposed first instantaneous signal amplitude level and further including the step of storing as the corrective factor signal that one of the two signal levels having the greatest amplitude; and

averaging the corrective factor signals for each scan line, the averaging step including generating for each corrective factor signal an adjusted signal level derived from averaging a first corrective factor signal located immediately before and a second corrective factor signal located immediately after the corrective factor signal being adjusted, the average of the first and second corrective factor signal being combined with the corrective factor signal being adjusted for generating and substituting therefor the adjusted signal level, and the averaging step being applied to a plurality of corrective factor signals being adjusted for producing from the adjusted signal levels a smoothed gain corrective function for each scan line, the gain corrective function being combined with the plurality of instantaneous signal amplitude levels for producing an output signal compensated for sensitivity variations in the image sensing device.

4,639,782

VIDEO SIGNAL PROCESSING APPARATUS FOR PROCESSING A VIDEO SIGNAL WHICH IS TRANSMITTED IN ACCORDANCE WITH A DOT INTERLACED SCHANNING SYSTEM AND INPUTTED THERETO

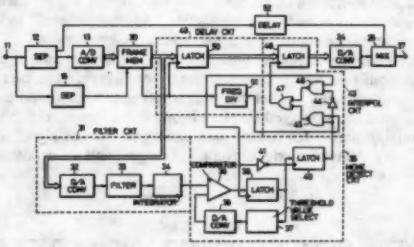
Akira Fujita, and Kyoichi Shimizu, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 13, 1985, Ser. No. 701,137

Claims priority, application Japan, Feb. 15, 1984, 59-26604

Int. Cl.[4] H04N *5/21, 5/208*

U.S. Cl. 358—166 **7 Claims**



1. A video signal processing apparatus for processing a video signal which is transmitted in accordance with a dot interlaced scanning system and inputted thereto, said video signal being obtained by carrying out a dot interlaced scanning in terms of four fields so that picture element data related to odd numbered picture elements in odd lines and picture element data related to even numbered picture elements in even lines are sampled and transmitted during the first and second fields and picture element data related to even numbered picture elements in odd lines and picture element data related to odd numbered picture elements in even lines are sampled and transmitted during the third and fourth fields, said video signal processing apparatus comprising:

first separating means for separating a luminance signal and a carrier chrominance signal from said video signal;

analog-to-digital converting means supplied with the luminance signal from said first separating means for subjecting the luminance signal to an analog-to-digital conversion to produce a digital luminance signal;

second separating means for separating synchronizing signals from said video signal;

memory means for writing therein and reading out therefrom the digital luminance signal, said memory means comprising clock pulse generating means for generating clock pulses, said memory means writing therein and reading therefrom the digital luminance signal responsive to the synchronizing signals which are separated by said second separating means and the clock pulse which is generated by said clock pulse generating means so that a digital luminance signal which corresponds to one field and in which luminance data of first and third dot inter-

laced fields alternately exist in each line is obtained during a certain time period of one field and a digital luminance signal which corresponds to one field and in which luminance data of second and fourth dot interlaced fields alternately exist in each line is obtained during a subsequent time period of one field;

luminance difference detecting means supplied with the digital luminance signal which is read out from said memory means for performing a detecting operation to detect a luminance difference between two digital luminance data which belong respectively to said first and third dot interlaced fields or belong respectively to said second and fourth dot interlaced fields and are in the same line and are within the digital luminance signal corresponding to one field, said luminance difference detecting means producing an output detection signal when the luminance difference is detected during two or more consecutive detecting operations;

interpolation means supplied with the digital luminance signal from said memory means for producing an interpolated digital luminance signal, said interpolation means normally passing the digital luminance signal in the absence of the output detection signal of said luminance difference detecting means, said interpolation means replacing one digital luminance data out of said two digital luminance data by the other digital luminance data in response to the output detection signal of said luminance difference detecting means;

digital-to-analog converting means for producing an analog luminance signal by subjecting the interpolated digital luminance signal to a digital-to-analog conversion;

delay means supplied with the carrier chrominance signal from said first separating means for delaying the carrier chrominance signal by a predetermined delay time to produce a delayed carrier chrominance signal; and

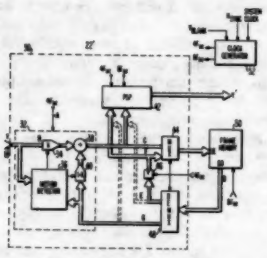
mixing means for mixing said analog luminance signal and said delayed carrier chrominance signal and for producing a video signal.

4,639,783

VIDEO SIGNAL FIELD/FRAME STORAGE SYSTEM

Russell T. Fling, Fishers, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1984, Ser. No. 676,814
Int. Cl.[4] H04N 5/14
U.S. Cl. 358—166 8 Claims



1. A video signal processing system utilizing a memory for temporary storage of video signal samples occurring at a predetermined rate, comprising:

a source of video signal samples;

means for operating said memory in a serial mode wherein data is output from said memory in the same sequence data is loaded into said memory;

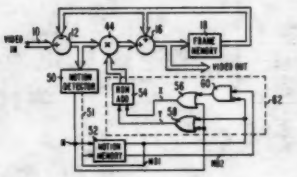
means coupled to said source and an output port of said memory for forming a sequence of samples alternating between said video signal samples from said source and samples from said memory output port, and applying said sequence as input samples to said memory.

4,639,784

VIDEO SIGNAL RECURSIVE FILTER ADAPTIVELY CONTROLLED RESPONSIVE TO THE HISTORY OF IMAGE MOTION

Russell T. Fling, Fishers, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 19, 1985, Ser. No. 702,612
Int. Cl.[4] H04N 5/21
U.S. Cl. 358—167 11 Claims



1. In a recursive filter system for filtering video signal, including means for delaying said video signal by one image period and means for scaling and combining said video signal and said delayed video signal from said delaying means, to produce recursively filtered output signals, apparatus for generating scale factors to be applied to said scaling means, comprising:

a motion detector including means for determining the difference between said video signal and said delayed video signals and comparing means responsive to said differences for generating a motion signal indicative of the occurrence of image motion between pixels of a current image period and a previous image period when the magnitude of said differnce exceeds a predetermined value;

means coupled to said motion detector for delaying said motion signal by substantially one image period to produce delayed replicas of said motion signal;

a decoder responsive only to said motion signal and said delayed replicas of said motion signal for selecting signals corresponding to said scale factors, for application to said scaling means from a predetermined set of predetermined arbitrary values, each of said arbitrary values being determined in relation to a particular number of frame segments since the lastmost detection of motion.

4,639,785

NON-SATURATING VIDEO OUTPUT AMPLIFIER

James C. Tallant, II, Noblesville City, and Robert P. Parker, Indianapolis, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 26, 1984, Ser. No. 593,094
Int. Cl.[4] H04N 5/68
U.S. Cl. 358—184 8 Claims

1. A video signal processing system comprising:

a source of video signal;

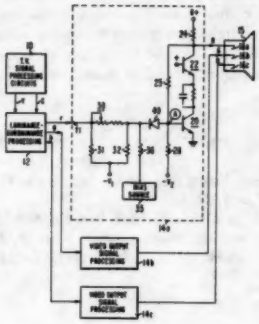
an image display device responsive to video signals applied to an intensity control electrode thereof;

a feedback driver amplifier with a signal input and a signal output for providing video drive signals to said intensity control electrode of said image display device, said amplifier including a feedback network with an impedance coupled from said signal output to said signal input;

an input circuit coupled to said source, for providing video signals to said amplifier input; and

a signal limiter included in said input circuit for limiting the magnitude of input signals greater than a given level to prevent saturation of said amplifier; said signal limiter being coupled between said source of video signal and said

feedback impedance and having an input for receiving a bias current via a signal current path from said source, and



an output for receiving a bias current via a signal path including said feedback impedance.

4,639,786

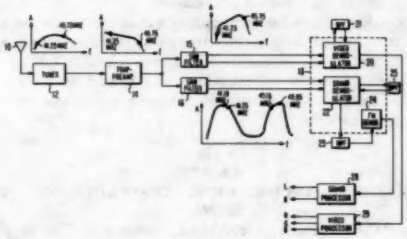
TELEVISION SOUND SIGNAL PROCESSOR

Gregory G. Tamer, Marion County, and David E. Hollinden, Monroe County, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 23, 1985, Ser. No. 790,458

Int. Cl.[4] H04N *5/62*

U.S. Cl. 358—197 **10 Claims**



1. In a video signal processing system including a section for processing an IF signal containing a modulated sound carrier and a modulated video carrier, apparatus comprising

a surface acoustic wave (SAW) filter for receiving said IF signal from said section, wherein to improve the quality of a sound signal ultimately derived from said modulated sound carrier said SAW filter has a first peak amplitude response at a first prdetermined frequency different from the frequency of said sound carrier and a second peak amplitude response at a second predetermined frequency different from the frequency of said video carrier. carrer.

4,639,787

IMAGE-SCANNING APPARATUS

Masaki Isogai, Tokyo, and Atsushi Kawahara, Kawasaki, both of Japan, assignors to Kyodo News Service and Nippon Kogaku K. K., both of Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,422

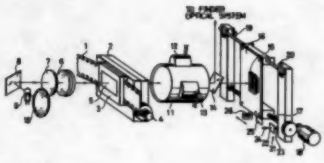
Claims priority, application Japan, Sep. 16, 1983, 58-170809

Int. Cl.[4] H04N *5/253, 5/238*

U.S. Cl. 358—214 **9 Claims**

1. Apparatus for generating picture signals having an optical system for forming an image of an object on a predetermined plane and means for scanning said object image by a light-receiving surface disposed on said predetermined plane and generating an output indicative of the light intensity distribution of said object image on said plane, the apparatus comprising:

(a) driving means for driving said scanning means relative to said object image to perform a first scan and a second scan, said driving means performing said second scan after the completion of said first scan;



(b) control means for controlling the exposure of the light-receiving surface of said scanning means during said second scan in accordance with the output of said scanning means generated during said first scan; and

(c) processing means for processing the output of said scanning means generated during said second scan into a picture signal corresponding to said object image in accordance with the output of said scanning means generated during said first scan.

4,639,788

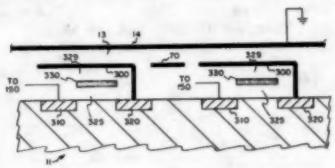
VIDEO DISPLAY METHOD AND APPARATUS

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Dec. 7, 1984, Ser. No. 679,228

Int. Cl.[4] H04N *5/74*

U.S. Cl. 358—233 **21 Claims**



1. In a video display apparatus for generating images represented by input video signals, said apparatus including: an array of semiconductor devices having respective electrodes arranged in a pattern of columns and rows; a layer of deformable material disposed over said electrodes, a conductive/reflective layer disposed over said deformable layer whereby electrical potentials between said conductive/reflective layer and the electrodes of said devices are operative to deform said conductive/reflective layer; and optical means for converting deformations of the conductive/reflective layer into an image; the improved method, comprising the steps of:

applying a bias potential to said conductive/reflective layer;

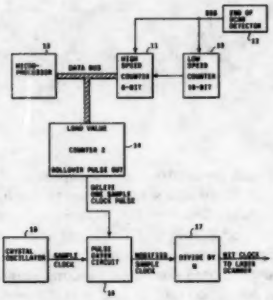
applying, during one field of a video frame, the input video signal to the electrodes of even rows of devices and a reference potential to the electrodes of odd rows of devices, said reference potential being different than said bias potential; and

applying, during the other field of a video frame, the input video signal to the electrodes of odd rows of devices and said reference potential to the electrodes of even rows of devices.

4,639,789
RASTER SCANNER VARIABLE-FREQUENCY CLOCK CIRCUIT

Douglas N. Curry, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1984, Ser. No. 615,002
Int. Cl.[4] H04N *1/04, 1/36*
U.S. Cl. 358—285 5 Claims

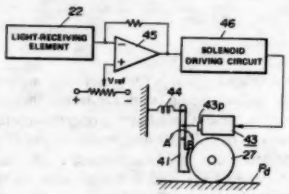


1. A digital circuit for varying the frequency of the bit clock in a raster input or output scanner comprising:
a sample clock generator,
means for measuring each scan duration,
means responsive to said measurement for deleting an evenly spaced number of sample clock pulses per scan, said number of deleted pulses per scan being a function of said measured scan duration, and
means for counting down the output of the means for deleting to produce the bit clock for the next scan.

4,639,790
IMAGE INPUT APPARATUS

Satoshi Kusaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,684
Claims priority, application Japan, Dec. 19, 1983, 58-239409
Int. Cl.[4] H04N *1/10, 1/22*
U.S. Cl. 358—293 4 Claims

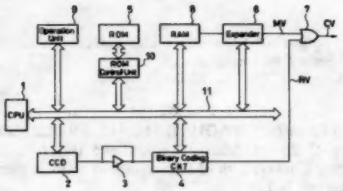


1. An image input apparatus comprising:
a housing;
a light source provided within said housing for illuminating an object surface;
a roller rotatably supported by said housing member so as to contact with said object surface;
postion detecting means said roller for detecting a rotation thereof;
a line sensor provided within said housing member for reading image information of said object surface through a lens array according to light provided from said light source and reflected by said image information surface;
a line sensor driving circuit for driving said line sensor;
memory means for storing a first output signal from said line sensor in accordance with a second output signal from said position detecting means representing the position of image information signal stored in said memory means;
a braking means for locking said roller; and
a light receiving means fro detecting the brightness of light from said light source, and means for releasing said braking means at the time the output of said light receiving means equal to a predetermined value.

4,639,791
IMAGE OVERLAY APPARATUS WITH ELECTRONIC IMAGE STORAGE

Hisaji Masaki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1984, Ser. No. 669,528
Claims priority, application Japan, Nov. 15, 1983, 58-215721
Int. Cl.[4] H04N *1/23, 1/29;* G03B *27/52, 27/10*
U.S. Cl. 358—300 12 Claims

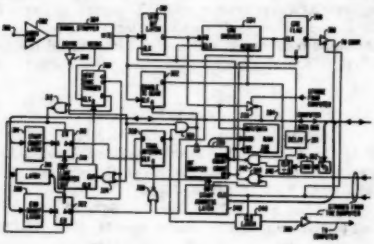


1. A recording apparatus comprising:
memory means for holding previously stored constant information and control information relating to a recording mode of the constant information;
recording means for synthesizing variable information and the constant information from said memory means and recording the synthesized information; and
control means for controlling said recording means to achieve synthesized recording in response to said control information.

4,639,792
APPARATUS FOR DECODING VIDEO ADDRESS CODE SIGNALS

Edwin C. Moxon, Boxboro, Mass., assignor to The Stypher Corporation, Hudson, Mass.

Continuation of Ser. No. 435,689, Oct. 21, 1982, Pat. No. 4,516,164. This application May 2, 1985, Ser. No. 729,652
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—335 7 Claims



1. In apparatus for reading coded information recorded on video magnetic tape, said apparatus having means for reading signals from said tape as said tape is run through said apparatus at different speeds, a local oscillator for generating sampling

signals at various frequencies, means responsive to said sampling signals for sampling said signals read from said tape to produce received information, the improvement comprising,

means responsive to the data content of selected portions of said received information read from said tape for adjusting the frequency of said sampling signals to produce error-free reception of said information.

4,639,793

SYSTEM FOR RECORDING OR DETECTING TWO MARKING SIGNALS ON A RECORD CARRIER

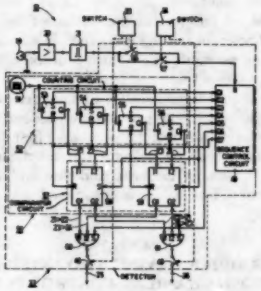
Peter Goldmann, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 539,491, Oct. 6, 1983, abandoned. This application Apr. 9, 1986, Ser. No. 850,442

Claims priority, application Austria, Dec. 7, 1982, 4450/82

Int. Cl.[4] G11B *27/28, 5/09*

U.S. Cl. 360—44 **9 Claims**



1. A system for recording and/or detecting marking signals of two different types, recorded on or scanned from a record carrier, which signal differ from each other in respect of at least one parameter, comprising:

a recording device for selectively recording marking signals, comprising generator means for generating the marking signals to be recorded on a record carrier, and

a detection device for detecting said marking signals, comprising detector means for detecting the marking signals read from the record carrier,

characterized in that the generator means comprises a single pulse generator only for supplying marking signals in the form of two marking-pulse trains having a same frequency to which a given period corresponds, but having different duty factors which differ from the value 0.5, the duty factor of one marking-pulse train being k and the duty factor of the other marking-pulse train being 1−k; means for enabling said generator for a period of time equal to a given plurality of said given periods only; and means for selecting one of said marking-pulse trains and for recording said selected train on the record carrier for said period of time, and

the detector means comprises a single duty-factor detector only, which detects the duty factor of a marking-pulse train with respect to a value of 0.5, during at least two consecutive periods, and in response to detection that said at least two consecutive periods have the same duty factor supplies a specific detection signal depending on the detected duty factor.

4,639,794

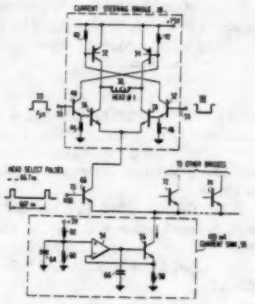
MULTIPLY PULSED MAGNETIC RECORDING

Herman Ferrier, Los Gatos, Calif., assignor to Fuji Photo Film Co., Ltd., Japan

Filed Jun. 19, 1984, Ser. No. 622,333

Int. Cl.[4] G11B *5/09, 5/02*

U.S. Cl. 360—46 **14 Claims**



1. A current driver for a magnetic recording head, comprising:

means for directing to said head a current of a polarity corresponding to a digital data signal pulse during the pulse width of said signal pulse; and

means for enabling said current directing means only during a plurality of separate write pulse widths occurring during a signal pulse width, the sum of said plurality of write pulse widths being substantially less than the signal pulse width, a repetition period of said write pulse widths being longer than a value that is a ratio of a value of a head gap of said recording head to a velocity of a magnetic tape moving relative to said magnetic recording head, said value being increased to account for movement of said tape during one said write pulse width.

4,639,795

SIGNAL TRANSMISSION CIRCUIT

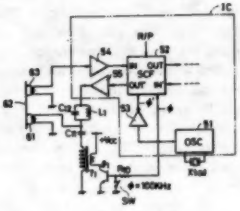
Kazuo Watanabe, and Tetsuo Sato, both of Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 578,786, Feb. 10, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 841,830

Claims priority, application Japan, Mar. 25, 1983, 58-48825

Int. Cl.[4] G11B *15/12, 5/02*

U.S. Cl. 360—62 **2 Claims**



1. A magnetic recording and playback apparatus, comprising

means including a playback amplifier for detecting a signal recorded on a magnetic tape;

a first switched capacitor circuit having an input connected to the output of said playback amplifier;

means including a recording amplifier for recording signals on a magnetic tape;

a second switched capacitor circuit having an output connected to the input of said recording amplifier;

control means including an oscillator circuit for generating control signals for controlling the operation of said first and second switched capacitor circuits; and

means connected to the output of said recording amplifier for generating an A.C. bias signal for said magnetic tape, wherein the difference frequency between the frequency of the control signals generated by said control means and the frequency of said A.C. bias signal is either zero or falls outside of the audio frequency band.

4,639,796

ARRANGEMENT FOR POSITIONING A TRANSDUCER TO AT LEAST ONE TRACK OF A TAPE-SHAPED RECORDING MEDIUM

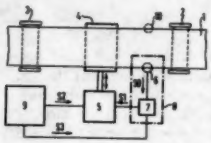
Erik Solhjell, Oslo, Norway, assignor to Tandberg Data A/S, Oslo, Norway

Filed Dec. 28, 1984, Ser. No. 687,527

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347632

Int. Cl.[4] G11B *5/55, 5/56*

U.S. Cl. 360—77 **9 Claims**



1. An arrangement for positioning a transducer perpendicular to the running direction of a plurality of tracks of a tape-shaped recording medium and to compensate transverse deviation of the recording medium as it runs through a magnetic recording machine housing, said arrangment comprising:

a fixed barrier device connected to the machine housing for emitting a light beam at an edge of the recording medium and producing an edge position signal in response to the light passing the edge;

control means operable to produce a positioning signal indicating the desired position of the transducer;

a converter connected to said light barrier for converting the edge position signal into a control signal representing the amount of transverse edge deviation; and

positioning means carrying the transducer, said positioning means connected to said converter and connected to said control means and operable in response to the position and control signal to move the transducer to a track represented by said positioning signal and to move the transverse transducer perpendicularly of the recording medium a distance equal to the transverse edge deviation.

4,639,797

RECORDING OR REPRODUCING APPARATUS

Junji Kobayashi, Tokyo, and Takashi Kimura, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,623

Claims priority, application Japan, Dec. 28, 1984, 59-279327

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—71 **7 Claims**

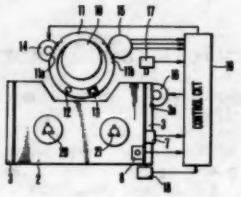
1. A recording or reproducing apparatus for use with a cassette housing therein a tape shaped record bearing medium, comprising:

(A) a rotary head drum assembly having at least one rotary head for recording signals on or reproducing signals from the medium;

(B) first means for selectively causing said cassette and said drum assembly to relatively come near to each other and to relatively go away from each other;

(C) detection means for detecting whether said cassette is loaded or not;

(D) loading means for pulling out the medium from said cassette and for engaging the pulled out medium with said



drum assembly, said loading means including at least one movable member which is selectively movable to a first position for pulling out the medium from the cassette, a second position for engaging the pulled out medium with the drum assembly and a third position between said first and said second position; and

(E) second means responsive to said detection means for operating said loading means, said second means moving said movable member between said first and said second positions when the cassette is loaded and moving the movable member between said first and said third positions when the cassette is not loaded.

4,639,798

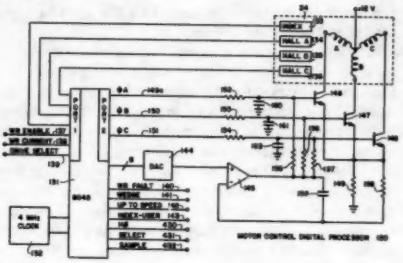
DISK DRIVE HAVING TWO INTERACTIVE ELECTROMECHANICAL CONTROL SUBSYSTEMS

Joel N. Harrison, Campbell; Vincent A. Condito, San Jose; Randolph H. Graham, Santa Clara; Brian J. Nixon, and Richard C. Simonsen, both of Pleasanton, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Division of Ser. No. 444,523, Nov. 26, 1982, abandoned. This application Dec. 6, 1985, Ser. No. 806,082

Int. Cl.[4] G11B *19/28*

U.S. Cl. 360—73 **10 Claims**



1. In a rotating disk data storage device including a brushless direct current motor having plural non-rotating field coils and including internal non-contacting commutation sensors, at least one data storage disk rotated by said motor, a data transducer for reading and writing data from and to data tracks on a storage surface of said disk, a transducer carriage for support-

ing said transducer, a power actuator for moving said carriage to position said transducer among selected data tracks, the improvement comprising:

driver circuit means connected for switching drive current among said coils and for varying said drive current,

programmed digital processor means connected to said commutation sensors and to said driver circuit means for calculating switching commands in accordance with data provided by said commutation sensors and for putting out said switching commands to said driver circuit means for switching said drive current, said processor means further connected for monitoring motor speed and for calculating speed correction values and putting them out to said circuit means for adjusting said drive current to maintain motor speed at a constant nominal value.

4,639,799

MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS WITH ROTATABLE DRUM HAVING INCLINED HEADS

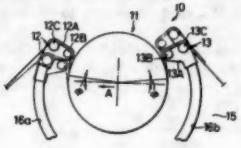
Osamu Inoue, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 19, 1984, Ser. No. 672,899

Claims priority, application Japan, Nov. 18, 1983, 58-178609[U]

Int. Cl.[4] G11B *15/66, 5/56*

U.S. Cl. 360—85 4 Claims



1. A magnetic tape recording and reproducing apparatus comprising:

(a) a rotatable head drum having heads and inclined with respect to a reference plane;

(b) a pair of movable tape guide members movably located in first positions respectively upstream and downstream of said head drum in a direction of travel of a magnetic tape, for guiding the magnetic tape to be wrapped helically around said head drum in a wrapping range along a tape path inclined with respect to said reference plane to allow each of said heads to scan said magnetic tape along a scanning locus to form thereon a track inclined with respect to a logitudinal direction of said magnetic tape in a recording mode;

(c) means for transporting said magnetic tape at a first speed in said recording mode and at a second speed different from said first speed in a playback mode;

(d) means for positioning said tape guide members in said first positions in said recording and playback modes; and

(e) said positioning means including means for displacing along said reference plane one of the tape guide members and locking said one of the tape guide members in a second position other than said first positions to change said wrapping range of the magnetic tape, whereby said tape path is shifted so that said formed track on the magnetic tape will be brought into conformity with the scanning locus of each of said heads when said magnetic tape is transported at said second speed in the playback mode,

wherein said positioning means comprises a pair of concentric annular loading gears supporting said tape guide members respectively thereon, a pair of motors, a pair of worms rotatable by said motors, and a pair of worm gears meshing with said worms and said loading gears.

4,639,800

TAPE RECORDER

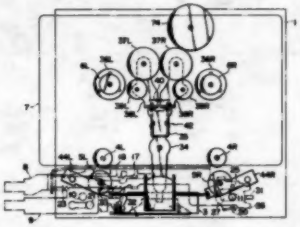
Shinsaku Tanaka, Tokyo, and Toshio Yoshimura, Kawasaki, both of Japan, assignors to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,265

Claims priority, application Japan, Nov. 23, 1983, 58-220289; Dec. 27, 1983, 58-246411

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—90 3 Claims



1. A tape recorder apparatus having a housing to which are mounted a magnetic head, two spaced reel shafts, means to engage said magnetic head with magnetic tape, means to drive said magnetic tape as it is engaged with said magnetic head to recore/reproduce signals, means to drive said magnetic tape at high speed, and means for changing tape feed direction, said apparatus comprising:

first operating member means mounted to said housing and selectively manually movable for reciprocating relative to said housing between its rest position and an actuating point along a given line to actuate said high speed tape driving means for one reel shaft when it reaches said actuating point;

second operating member means mounted to said housing and selectively manually movable for reciprocating relative to said housing between its rest position and an actuating point along a line parallel to said given line to actuate said high speed tape driving means for another reel shaft when it reaches said actuating point;

resilient means to bias said first and second operating member means away from said actuating point and toward said rest position;

a tape-direction changing piece mounted to said housing for pivotal and linear movement relative thereto, said first operating member means pivoting said piece, exclusive of said second operating member means, in one direction of rotation when it advances along said given line to the actuating point, said second operating member means pivoting said piece, exclusive of said first operating member means, in the other direction of rotation when it advances along said parallel line to said actuating point, said first and second operating member means when moved together to an intermediate point between the rest position and said actuating point causing said piece to linearly move parallel to said given line to actuate said means for changing tape feed direction.

4,639,801

LOADING MECHANISM FOR A MAGNETIC TAPE CASSETTE APPARATUS

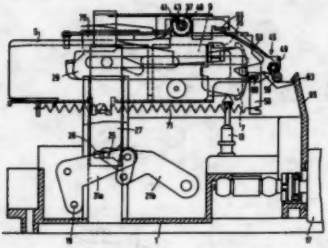
Rolf D. Hoppmanns; Walter Steup; Willibald Wieczorek, all of Krefeld, Fed. Rep. of Germany, and Franz Beitler, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1984, Ser. No. 628,701

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1983, 3325053

Int. Cl.[4] G11B *5/008*

U.S. Cl. 360—96.5 **10 Claims**



1. A loading mechanism for a magnetic tape cassette apparatus comprising a cassette holder having an ejection slide movable with respect to the holder between an outward position and a pushed-in position, means for locking the ejection slide in the pushed-in position, and a lifting device arranged for moving said cassette holder up and down when the cassette is in said pushed-in position,

characterized by comprising a latch on said ejection slide,

a pivoting catch pivotally mounted on said holder, said catch being pivotable to a locked position for engaging said latch when the slide is in the pushed-in position,

a tilting lever, and means mounting said tilting lever to said holder to permit pivotable movement of said lever with respect to said holder and said catch, and

a control element arranged to engage said tilting lever when the cassette holder is moved upwards and downwards, arranged such that said tilting lever moves along said control element without performing any function during one of the directions of cassette holder movement, and that during movement of holder in the other direction the tilting lever engages said control element and the catch so as to pivot the catch out of the locked position, thereby unlocking the ejection slide for movement toward said outward position.

4,639,802

SHRINK RING FOR DISK CLAMPING

Jerry L. Neubauer, Stewartville; Laurence J. Schmidt, and Steven H. Voss, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,330

Int. Cl.[4] G11B *5/012*

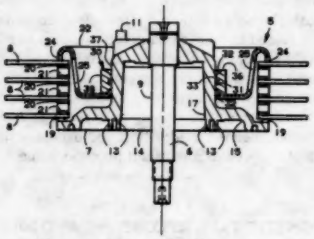
U.S. Cl. 360—98 **4 Claims**

1. In a disk drive with a plurality of storage disks, a storage disk assembly including a hub on which said disks are mounted about a common axis in axially spaced relationship for unitary rotary motion comprising

means on said hub for supporting said disks in one axial direction, and

a shrink ring surrounding a portion of said hub and secured to said hub by interference fit to maintain a predetermined axial force in the direction opposite said one axial direction,

said shrink ring having a substantially cylindrical outer surface and a substantially cylindrical inner surface with the axial length of said outer surface exeeding the axial length of said inner surface, whereby the outer surface presents an enlarged heat transfer surface and the inner surface presents a reduced heat transfer surface confronting said hub,



said shrink ring being heated and assembled about said hub and an axial force maintained as said ring cools to establish said interference fit and said predetermined axial force on said plurality of disks.

4,639,803

THIN FILM MAGNETIC HEAD SLIDER

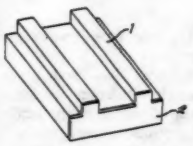
Yukio Takeda, Hitachi; Shiro Iijima, Mito; Shinsuke Higuchi, Hitachi; Masaki Ohura, and Sadanori Nagaike, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,493

Claims priority, application Japan, Jul. 31, 1984, 59-161281

Int. Cl.[4] G11B *5/60*

U.S. Cl. 360—103 **3 Claims**



1. A thin film magnetic head slider, comprising:

a slider body formed of a sintered material comprising a mixture of AlN and TiN;

a thin film transducer disposed on the end surface of said slider body;

said mixture having a ratio of the volume % of AlN to TiN in the range of 50:50 through 99:1.

4,639,804

HEAD LOADING SYSTEM

Yoshihiro Moribe, Chigasaki; Yukitaka Hayashi, Odawara; Hideo Maekawa, Yokohama, and Kunitsugu Tsukai, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,592

Claims priority, application Japan, Mar. 19, 1982, 57-42745

Int. Cl.[4] G11B *5/54*

U.S. Cl. 360—105 **11 Claims**

1. A head loading system comprising:

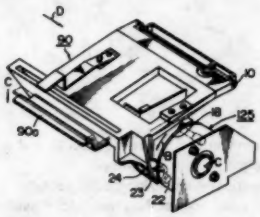
at least one head support mechanism supporting at least one head for at least reproducing information in juxtaposed relation to one surface of a recording medium; and

a loading actuator for driving said head support to move said head toward and away from said one surface of said recording medium;

said load actuator comprising:

a solenoid including a plunger for moving the plunger in a linear motion in a direction substantially parallel to said one surface of said recording medium;

motion converting means for converting the linear motion of said plunger of said solenoid into a rotary motion, said motion converting means having an axis of rotation parallel to the direction of movement of the linear motion; and



a bail having opposite ends, said bail being driven at one of said opposite ends by the rotary motion of said motion converting means and pivotally supported only at the other end thereof about an axis substantially parallel to said one surface of said recording medium; and

said support mechanism comprising a hook to be engaged by said one end of said bail.

4,639,805

COMBINATION OF REPRODUCING HEADS AND A ROTARY TRANSFORMER DEVICE

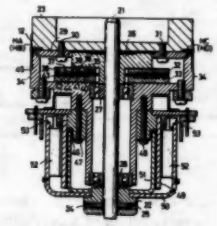
Akira Hirota, Chigasaki, and Masahiko Tsuruta, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Nov. 22, 1983, Ser. No. 554,457

Claims priority, application Japan, Nov. 25, 1982, 57-178265[U]

Int. Cl.⁴ G11B 5/52

U.S. Cl. 360—108 **6 Claims**



1. A combination of reproducing heads and a rotary transformer device,

said reproducing heads being constituted by a first pair of mutually opposing heads each having a gap of a first azimuth angle and a second pair of mutually opposing heads each having a gap of a second azimuth angle, said first azimuth angle being different from said second azimuth angle, said first and second pairs of heads being mounted on a rotary body with an equi-angular separation of 90° between two adjacent heads, said rotary body being wrapped with a magnetic tape around a peripheral surface thereof over an angular range which is greater than 270° but less than 360° and rotating at a rotational speed of 270° per unit, said unit being 1/n times one field period of a video signal which is pre-recorded on said magnetic tape, where n is a natural number, three heads out of said first and second pairs of heads constantly making contact with said magnetic tape at one time while one of said three heads scans over a desired track which is pre-recorded with video signal by a head having a gap of the same azimuth angle as that of said one head, each of two remaining heads out of said three heads generating an undesired signal by scanning over a part of a track which is pre-recorded with the video signal by a head having a gap of the same azimuth angle as that of each of said two remaining heads and is adjacent to said desired track,

said rotary transformer device comprising:

a rotary core rotating unitarily with said rotary body, said rotary core having five circular grooves arranged and formed in one surface thereof;

first through fourth ring-shaped coils embedded in four of said five grooves of said rotary core excluding a center groove which is located at an innermost position of said five grooves;

a first short-circuiting ring embedded in said center groove among said five grooves of said rotary core;

a stationary core located at a position opposing said one surface of said rotary core with a slight gap formed between said stationary core and said one surface of said rotary core, said stationary core being stationary and having five circular grooves arranged and formed in one surface thereof which opposes said one surface of said rotary core, said give grooves of said stationary core respectively opposing said five grooves of said rotary core;

fifth through eighth ring-shaped coils embedded in four of said five grooves of said stationary core excluding a center groove which is located at an innermost position of said five grooves, said fifth through eighth ring-shaped coils performing transmission and reception of signals between said first through fourth ring-shaped coils which are embedded in said rotary core; and

a second short-circuiting ring embedded in said center groove among said five grooves of said stationary core, said second short-circuiting ring opposing said first short-circuiting ring,

said first and second ring-shaped coils located on one side with respect to said first short-circuiting ring being coupled to said first pair of heads,

said third and fourth ring-shaped coils located on a side opposite to said one side with respect to said first short-circuiting ring being coupled to said second pair of heads.

4,639,806

THIN FILM MAGNETIC HEAD HAVING A MAGNETIZED FERROMAGNETIC FILM ON THE MR ELEMENT

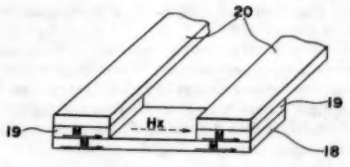
Toru Kira, Tenri; Teiichi Miyauchi, Nara, and Mitsuhiko Yoshikawa, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 6, 1984, Ser. No. 577,389

Claims priority, application Japan, Sep. 9, 1983, 58-167312; Nov. 30, 1983, 58-228125

Int. Cl.⁴ G11B 5/127; G01R 33/02

U.S. Cl. 360—113 **2 Claims**



1. A thin film magnetic head for detecting, as a change in electric resistance, a change in signal magnetic field to be applied along the magnetization-hard-axis direction of an elongated metal ferromagnetic thin film (MR element) having

uni-axis anisotropy, which comprises a ferromagnetic film, which is sufficiently larger in coercive force than said metal ferromagnetic thin film (MR element), said ferromagnetic film being exclusively magnetized along a longitudinal direction of said elongated MR element and arranged on a superposed portion between a lead conductor portion and said metal ferromagnetic thin film (MR element), said metal ferromagnetic thin film (MR element) being coupled in a ferromagnetic exchange interaction relationship with said ferromagnetic film to thereby increase the sensitivity of the head, while suppressing Barkhausen noise.

4,639,807

MAGNETIC DETECTOR HAVING MAGNETORESISTIVE ELEMENTS

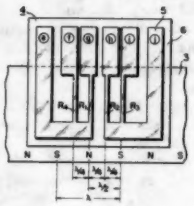
Sadao Sekizawa; Toshio Seki, and Tadashi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,519

Claims priority, application Japan, Mar. 15, 1982, 57-39574

Int. Cl.⁴ G11B *5/127*; G01B *7/14*

U.S. Cl. 360—113 **10 Claims**



1. A magnetic detector used in an arrangement close to and opposite to a magnetic recording medium with a relative movement provided between the magnetic detector and the magnetic recording medium, the magnetic detector comprising:

a plurality of elongated stripe-shaped magnetoresistive elements formed in juxtapositional relation with one another on a non-magnetic substrate, each magnetoresistive element extending in a longitudinal direction transverse to the direction of relative movement between the magnetic detector and the magnetic recording medium and having a first and a second end;

bridge output terminals connected to respective first ends of said magnetoresistive elements in the longitudinal directions thereof; and

common terminal means having one end connected to the second ends of at least two of said magnetoresistive elements in the longitudinal directions thereof, said common terminal means having an intermediate portion with a width larger than the width of each of the magnetoresistive elements and extending along and parallel to an outerside face of the outermost one of said elongated longitudinally extending magnetoresistive elements to another end portion at a position adjacent to said bridge output terminals provided at said first ends of said magnetoresistive elements, whereby the magnetic detector has a small width and high sensitivity.

4,639,808

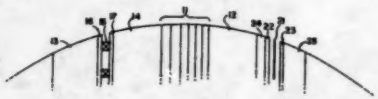
ASYMMETRICAL SHIELDS FOR CONTROLLING FEEDTHROUGH IN READ/WRITE HEADS

Richard Thornley, Boulder County, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 26, 1984, Ser. No. 655,011

Int. Cl.⁴ G11B *5/115, 5/14, 5/27*

U.S. Cl. 360—121 **6 Claims**



1. A transducer for writing data to and reading data from a magnetic medium comprising:

a magnetically shielding center section;

a write head disposed on one side of said center section; and

a read head on the other side of said center section, said read head including

a shielded magnetoresistive element and

first and second read shields, and on each side of said magnetoresistive element, the read shield closest to said write, head being thinner than the other read shield to reduce magnetic feedthrough between said write head and said read head.

4,639,809

MAGNETIC HEAD

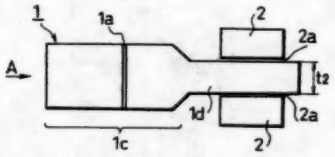
Tetsuya Iwata, Koide, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Nov. 15, 1984, Ser. No. 671,634

Claims priority, application Japan, Nov. 16, 1983, 58-176027[U]

Int. Cl.⁴ G11B *5/27, 5/22*

U.S. Cl. 360—121 **3 Claims**



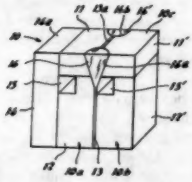
1. In a magnetic head comprising a recording/reproducing core having a tip end portion of a generally elongated rectangular shape extending in a longitudinal direction which a magnetic media is moved relative to said tip end portion, said tip end portion having a recording/reproducing gap formed at a position intermediate its ends along said longitudinal direction, and a pair of erasing cores arranged opposing each other in a direction transverse to said longitudinal direction with each erasing core disposed adjacent a respective side of said tip end portion in said transverse direction,

the improvement wherein said tip end portion has an upstream (relative to said longitudinal direction of movement of said magnetic media) portion including said gap which is provided with a given thickness in the transverse direction suitable for a desired mechanical strength property, and a downstream portion parallel to said upstream portion which is thinner compared to said given thickness so as to be suitable for a higher density recording property, and said erasing cores are arranged on opposite sides of said downstream portion of reduced thickness.

4,639,810
MAGNETIC HEAD FOR PERPENDICULAR MAGNETIZATION

Kunihide Sakai, Ebina, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Feb. 17, 1984, Ser. No. 581,070
Claims priority, application Japan, Feb. 18, 1983, 58-24756
Int. Cl.[4] G11B 5/127, 5/187
U.S. Cl. 360—125 7 Claims



1. A magnetic head for perpendicular magnetization, comprising:

(a) a body of a nonmagnetic material having a surface for sliding contact with a magnetic recording medium;

(b) a yoke of a ferromagnetic material, said body being mounted on said yoke;

(c) a film of a ferromagnetic material having a relatively high saturation magnetic density held in direct contact with a side of said yoke and having an end exposed in said surface;

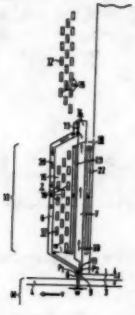
(d) a coil wound around said yoke and said film in direct contact with said film; and

(e) a block of a ferromagnetic oxide material attached to a side of said body and said yoke for cooperating with the magnetic recording medium, said film, and said yoke in defining a closed magnetic path.

4,639,811
COMBINED MAGNETIC WRITE AND READ HEAD FOR THE VERTICAL MAGNETIZATION OF A CORRESPONDING RECORDING MEDIUM

Heinrich Diepers, Viet-Stoss-Str, and Herbert Schewe, Haydnstr, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,055
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346876
Int. Cl.[4] G11B 5/127, 5/17
U.S. Cl. 360—125 11 Claims

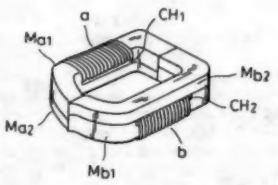


1. A combined magnetic write and read head for a recording medium, the recording medium being provided with at least one magnetizable storage layer into which information can be written along and read from a track by perpendicular magnetization of the storage layer, said magnetic head comprising a ring-shaped magnetic conduction body for carrying magnetic flux having two magnet legs, the magnet legs each having a pole at ends of the magnet legs facing the medium and which are arranged adjacently one behind the other in a direction of relative motion of the head and medium and at a predetermined distance from each other, at least one read coil winding being associated with said magnetic conduction body, the turns of the read coil winding extending through a space formed between the magnet legs, said read coil winding serving for executing a read function, an additional coil winding being provided for executing a write function, said additional coil winding at least partially surrounding one of said magnet legs, the other of said magnet legs having, at least in a subsection thereof, a predetermined small cross section relative to a cross section of said one of said magnet legs, whereby said subsection is driven at least largely into magnetic saturation, as a result of the difference in said cross sections of said magnet legs, during the write function by said additional write coil winding while the read coil winding is deenergized.

4,639,812
MAGNETIC HEAD AND APPARATUS FOR AUTOMATICALLY ADJUSTING THE AZIMUTH POSITION THEREOF

Niro Nakamichi, Tokyo, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,745
Claims priority, application Japan, Nov. 8, 1982, 57-194613
Int. Cl.[4] G11B 5/147, 5/127, 5/00, 20/20
U.S. Cl. 360—126 5 Claims



1. An apparatus for reproducing a signal recorded on a magnetic tape, comprising:

a magnetic head which includes a core having a single gap corresponding to a predetermined recording track of said magnetic tape, said core including left-hand right-hand core parts which are spaced in a direction of travel of said tape, each of said core parts including an uper core piece and a lower core piece, the ratio of the thickness of the upper core piece to the thickness of the lower core piece being less than 1 for one of said left-hand and right-hand core parts and being greater than 1 for the other thereof, said magnetic head further including first and second pick-up coils which each encircle a portion of the thicker core piece of a respective one of said left-hand and right-hand core parts;

means supporting said magnetic head for movement in directions effecting variation of the azimuth position of said magnetic head relative to the magnetic tape; and

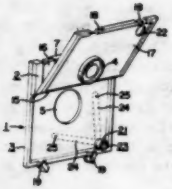
means responsive to output signals from said first and second pick-up coils and cooperable with said magnetic head for causing movement of said magnetic head which adjusts the azimuth position of said magnetic head relative to a recorded signal on said recording track.

4,639,813

CLEANING DISKET WITH INTERNAL PATHS FOR CLEANING LIQUID

Masatoshi Uno, Tokyo, Japan, assignor to Kabushiki Kaisha Nagaoka, Tokyo, Japan

Filed Jun. 7, 1985, Ser. No. 742,406
Claims priority, application Japan, Nov. 27, 1984, 59-249966
Int. Cl.[4] G11B *5/10, 5/127, 5/41, 3/58*
U.S. Cl. 360—128 **7 Claims**



1. A head cleaning apparatus comprising:

a case formed to the same shape and dimension of a hard case for a floppy disk;

a cleaning sheet adapted to be rotated in the case and formed to the same shape and dimension of the magnetic disk of a floppy disk; and

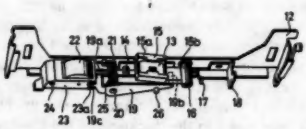
a cleaning liquid inlet tube provided to the case having means for supplying a cleaning liquid to the cleaning sheet with the cleaning liquid injected under pressure from outside the case, the cleaning liquid inlet tube being in communication with liquid supply paths extending within the case, said liquid supply paths having ejection holes opposing the cleaning sheet for causing the liquid to permeate the disk.

4,639,314

TAPE RECORDER WITH IMPROVED TAPE CASSETTE PAD SHIFTER

Shigeto Ueno; Masanori Ohnishi; Yuji Nakamura, and Shinichi Tanaka, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 18, 1983, Ser. No. 467,919
Claims priority, application Japan, Feb. 19, 1982, 57-26279
Int. Cl.[4] G11B *15/60*
U.S. Cl. 360—130.1 **2 Claims**



1. A tape recorder for use with a tape cassette including a case having an access opening and a magnetic tape and a resiliently biased pad disposed in the case, the tape recorder having a plurality of different modes of operation, comprising:

(a) a base comprising a cassette holder for receiving the tape cassette;

(b) a magnetic head fixedly mounted on said base for contact with the magnetic tape through the access opening when the tape cassette is inserted in the tape recorder;

(c) a pad position control member movably mounted on said base for displacing the pad through the access opening when the tape cassette is inserted in the tape recorder, said pad position control member including a pad presser having a pair of opposite edges spaced from each other by a distance smaller than the width of said resiliently biased pad;

(d) means responsive to selection of at least one of the tape recorder modes for actuating said pad position control member in a first direction to allow the pad to press the magnetic tape against said magnetic head through the acess opening and between said edges of said pad presser and also responsive to selection of at least one of the other tape recorder modes for actuating said pad position control member in a second direction opposite to said first direction to enable said pad presser to displace the pad out of pressing contact with the magnetic tape, said means comprising a first spring acting between said cassette holder and said pad position control member for normally urging the latter in said first direction, a control arm movably mounted on said base and engaging said pad position control member, a second spring acting between said cassette holder and said control arm for normally urging said control arm in said second direction, said second spring having a resiliency larger than that of said first spring for enabling said control arm to be displaced in said second direction to a stop mode of operation, and an operator-controlled rod movable in response to selection of recording playback modes of operation for pressing said control arm in said first direction against the resiliency of said second spring to permit said pad position control member to move in said first direction under the resiliency of said first spring, whereby the pad is allowed under its own resiliency to press the magnetic tape against said magnetic head;

(e) said eassctte holder including a pair of first and second pins, said pad position control member comprising a pad presser positioned adjacent to said magnetic head and engageable with the pad and a support supporting said pad presser and pivotably mounted on said first pin, said first spring engaging said support, said control arm being pivotably mounted on said second pin and having a presser held in engagement with said pad position control member, said second spring being mounted on said second pin; and

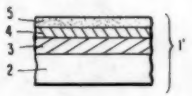
(f) said magnetic head having a pair of recesses spaced from each other for receiving therein said edges, respectively, of said pad presser when said pad position control member is moved in said first direction.

4,639,815

MAGNETIC RECORDING MEDIUM WITH CHROMIUMIRON PROTECTIVE LAYER

Yoshihiro Arai, and Akira Nahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1984, Ser. No. 604,549
Claims priority, application Japan, Apr. 28, 1983, 58-75402
Int. Cl.[4] G11B *5/74*
U.S. Cl. 360—131 **5 Claims**

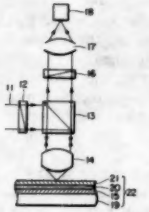


1. A magnetic recording medium comprising a non-magnetic support, a thin magnetic metal film on the support, and a protective layer on the thin magnetic film, to improve corrosion and scraping resistance, said protective layer containing chromium and iron and nickel, the chromium being present in an amount of 6 to 40 wt % nickel in an amount of not more than 20 wt % and iron, being the remainder, wherein the protective layer has a thickness in a range of from 10 Å to 200 Å.

4,639,816
MAGNETO-OPTICAL RECORDING MEDIUM

Yasuo Tomita, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,698
Claims priority, application Japan, Sep. 27, 1982, 57-168123; Sep. 27, 1982, 57-168121; Sep. 27, 1982, 57-168122
Int. Cl.[4] G11B 5/74, 23/00
U.S. Cl. 360—131 6 Claims



1. A magneto-optical recording medium which is adapted for use in a reading system in which a linearly polarized light beam is projected on said medium whereby a light beam reflected by said medium is detected by a photoconductor, said photoconductor having a multiplying function, said magneto-optical recording medium comprising:

a substrate;

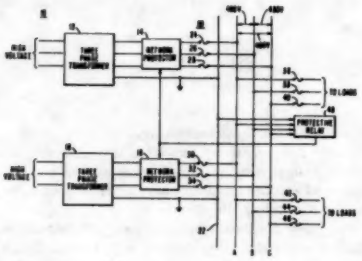
a magnetic film formed on said substrate, said magnetic film having an axis of easy magnetization perpendicular to the magnetic film surface; and

a dielectric material layer formed on and in contact with said magnetic film to establish a reflection factor at the magnetic film surface, said reflection factor being about 10% or less.

4,639,817
PROTECTIVE RELAY CIRCUIT FOR DETECTING ARCING FAULTS ON LOW-VOLTAGE SPOT NETWORKS

John H. Cooper, Murrysville, and William H. South, McKeesport, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1984, Ser. No. 610,539
Int. Cl.[4] H02H 3/22
U.S. Cl. 361—62 4 Claims



1. A protective relay for detecting a power arc fault in an AC three-phase electrical power spot network including a bus having phase A, B, and C conductors and a neutral conductor for distributing power to at least one load, a plurality of power sources for supplying power to said bus, and means for interrupting power to said bus from said plurality of power sources, said protective relay comprising:

means coupled to each of the phase A, B, and C conductors and the neutral conductor to provide a first voltage signal representative of the voltage difference between the phase A conductor and the neutral conductor, to provide a second voltage signal representative of the voltage difference between the phase B conductor and the neutral conductor, and to provide a third voltage signal representative of the voltage difference between the phase C conductor and the neutral conductor, each voltage signal representing its corresponding phase voltage fundamental frequency and all phase voltage harmonics thereof which are present on the corresponding phase conductor;

first, second, and third bandpass filter means corresponding to said first, second, and third voltage signals respectively, each bandpass filter means for passing only a predetermined band of harmonic frequency components of its corresponding voltage signal to produce first, second, and third filtered signals, said predetermined band of harmonic frequencies including frequencies substantially between 1 kHz and 100 kHz, thereby being limited substantially to include only harmonic frequencies which are indicative of power arc faults;

first, second, and third amplifier means responsive to said first, second, and third filtered signals, respectively, to produce first, second, and third amplified signals;

first, second, and third rectifier means for rectifying and averaging the harmonic frequency components of said first, second, and third amplified signals to produce first, second, and third rectified signals in response thereto;

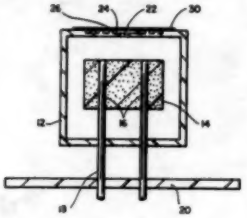
first, second, and third peak detector means which produce first, second, and third peak signals representative of the peaks of said first, second, and third rectified signals, respectively; and

timer means which indicates a fault when one of said first, second, and third peak signals is substantially at at least a predetermined magnitude for a specified time interval, thereby indicating the presence of a permanent power arc fault.

4,639,818
VENT HOLE ASSEMBLY

Gabe Cherian, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 17, 1985, Ser. No. 776,943
Int. Cl.[4] H02H 5/04
U.S. Cl. 361—106 19 Claims



1. An assembly which comprises

(1) at least one circuit protection device which comprises a PTC conductive polymer element;

(2) a hollow enclosure which surrounds and is spaced apart from the protection device, which is hermetically sealed except for at least one vent, and whose exterior surface adjacent the vent is provided with a plurality of channels; and

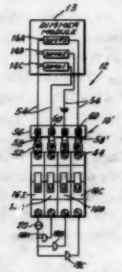
(3) a deformable cover member which is releasably secured to the exterior surface of the enclosure which defines the vent and the channels.

4,639,819

PROTECTIVE BYPASS FOR ELECTRONIC CIRCUITS

David Kirby, Emmaus, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, P

Filed Aug. 6, 1984, Ser. No. 637,862
Int. Cl.[4] H01R 31/08
U.S. Cl. 361—115 20 Claims



1. A protective bypass circuit optionally shortcircuiting the lugs of a plurality of circuit breakers, said bypass circuit comprising:

a plurality of lug plates each having first and second sections, said first section of each lug plate being received in and clamped by a lug of a respective circuit breaker;

a plurality of lead wire clamping elements, each said clamping element being electrically coupled to said first section of a respective said lug plate and adapted to releasably clamp a lead wire thereto;

a shorting bus bar; and

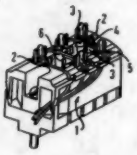
means for releasably coupling said shorting bus bar to said second section of each of said lug plates.

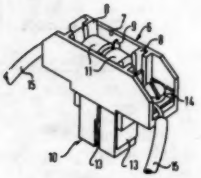
4,639,820

PROTECTIVE ELEMENT FOR DISTRIBUTOR STRIPS

Franz Dolansky, Munich, and Ewald Steiner, Berg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,342
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412421
Int. Cl.[4] H02H 3/22
U.S. Cl. 361—124 4 Claims





1. A protective element for distributor strips having a plurality of double terminal post means for non-stripped connection of electrical conductors arranged in two rows, a plurality of upwardly open receptacle chamber means being provided between the two rows for receiving respective surge arresters in an upper portion of the distributor strip, contact springs being connected to the respective double terminal post means at outer sides of the receptacle chamber means, and portions of a grounding rail projecting into the receptacle chamber means between the contact springs opposite one another in the chamber means, comprising:

a lower part of the protective element being designed as a plug means for insertion into at least one of the receptacle chamber means for the distributor strip;

an upwardly open receptacle chamber means being provided in the protective element for accommodating surge arresters at an upper part of the protective element;

contact springs opposite one another at sides of the receptacle chamber means and a grounding rail having a portion projecting into the receptacle chamber means between the contact springs;

the contact springs and the grounding rail portion being connected via the plug means to the contact springs and the grounding rail of a receptacle chamber means of the distributor strip in which the protective element is plugged; and

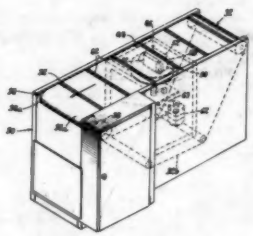
each contact spring in the protective element being connected to a screw terminal positioned outside of the receptacle chamber means in the protective element.

4,639,821

DEGAUSSER/DEMAGNETIZER

Kenneth M. Littwin, Chicago; Joseph A. Armond, River Grove; Gabriel R. Buky, and Fred Patrick, both of Chicago, all of Ill., assignors to Electro-Matic Products Co., Chicago, Ill.

Filed Jul. 10, 1985, Ser. No. 753,597
Int. Cl.[4] H01F 13/00
U.S. Cl. 361—151 13 Claims



1. Degausser apparatus comprising,

a conveyor adapted to be moved along a linear path, and having a supporting surface for supporting articles to be degaussed and operable for carrying them along the path,

means for so moving the conveyor,

a magnet having a fixed magnetic field positioned closedly adjacent said supporting surface with pole surfaces lying in a common plane and its magnetic field extending through said supporting surface and into articles on the supporting surface,

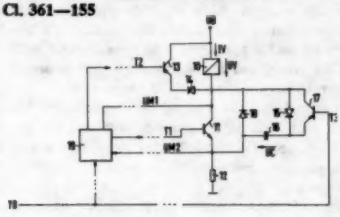
the magnet being rotatable bodily about an axis extending through said supporting surface with its magnetic field remaining fixed relative to the magnet, whereby the magnetic field extends through the articles in direction constantly changing corresponding to the rotation of the magnet, and

means for rotating the magnet.

4,639,822
ARRANGEMENT FOR RAPID SWITCHING OF AN ELECTROMAGNETIC LOAD

Hans Kubach, Korntal-Münchingen, and Hartmann Rupp, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 28, 1985, Ser. No. 770,646
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442764
Int. Cl.[4] H01H *47/32*
U.S. Cl. 361—155 14 Claims

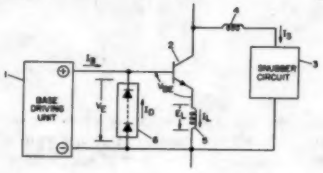


1. A switching arrangement for an electromagnetic load which is interposed between two points one of which is at a predetermined electrical potential difference from the other, comprising switching means arranged in series with the electromagnetic load and operative for selectively enabling and disabling electric current flow in a predetermined direction through the electromagnetic load to energize and deenergize the latter; controllable capacitor means arranged in parallel with said switching means; and means for controlling the operation of at least said capacitor means in such a manner as to be charged to a potential difference exceeding said predetermined potential difference with respect to the other point while the electromagnetic load is energized, and as to discharge during the de-energization of the electromagnetic load with attendant electric current flow from said capacitor means through the electromagnetic load to the one point in a direction opposite to said predetermined direction.

4,639,823
CONTROL CIRCUIT FOR SWITCHING TRANSISTORS

Kazuo Kuroki, Tokyo, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 18, 1984, Ser. No. 682,916
Claims priority, application Japan, Dec. 27, 1983, 58-247276
Int. Cl.[4] H01H *47/00*; H03K *17/60*
U.S. Cl. 361—159 1 Claim

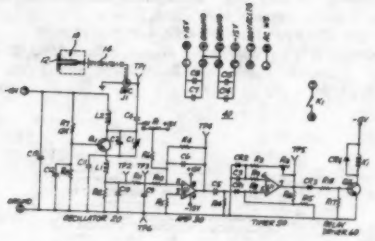


1. A circuit arrangement including a switching transistor having emitter, base and collector electrodes, snubber circuit means including associated distributed reactance, inductance means, diode means and base driving means for switching the transistor characterized in that the emitter-collector circuit branch includes in series the inductance means and the snubber circuit means and the emitter-base circuit branch includes in series the inductance means and the parallel arrangement of the diode means and the base driving means, the diode means being poled such that the electromotive force generated in the inductance means as the current decreases when the transistor is switched off is applied to the base of the switching transistor.

4,639,824
TOUCH SENSOR FOR WIRE STRIPPER

James J. Furlong, Seattle, and Dwayne E. Howe, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 353,750, Mar. 1, 1982, abandoned. This application Sep. 28, 1984, Ser. No. 655,495
Int. Cl.[4] H01H *47/12*
U.S. Cl. 361—179 3 Claims



1. An adjustable picofarad detector circuit comprising in combination:

a capacitance sensing probe having an electrically conductive plate member;

an oscillator circuit coupled to said capacitance sensing probe;

a timer circuit;

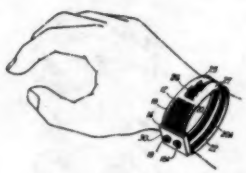
an inverse amplifier circuit coupled between said oscillator circuit and said timer circuit for providing a discrete level output signal when said electrically conductive plate member contacts a wire thereby triggering said timer circuit; and,

a relay driver circuit responsive to said timer circuit for an adjustable time period.

4,639,825
STRETCHABLE GROUNDING STRAP HAVING REDUNDANT CONDUCTIVE SECTIONS

Albert C. Breidegam, Sharpsburg, Ga., assignor to Semtronics Corporation, Peachtree City, Ga.

Continuation-in-part of Ser. No. 654,636, Sep. 25, 1984, Pat. No. 4,577,256. This application Dec. 2, 1985, Ser. No. 804,052
Int. Cl.[4] H05F *3/00*
U.S. Cl. 361—212 38 Claims



1. A strap for establishing electrical contact with a persons' body comprising:

(a) a plurality of sections of electrically conductive material;

(b) a plurality of non-conductive means, each for electrically separating two adjacent electrically conductive sections; and

(c) a plurality of fittings, each of which:

(i) is in electrical contact with one of the sections of electrically conductive material; and

(ii) receives an electrically conductive cord for connect-

ing the sections of electrically conductive material to ground.

4,639,826

RADIATION-HARDENED CASING FOR AN ELECTRONIC COMPONENT

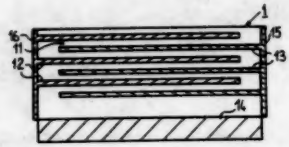
Christian Val, St. Remy-les Chevreuses; Joseph Pinel, Villefranche-de-Lauragais, and Yves B. Gibod, St. Cyr-L'Ecole, all of France, assignors to Compagnie d'Informatique Militaire, Spatiale e. Aeronautique, Paris, France

Filed May 24, 1984, Ser. No. 613,905

Claims priority, application France, Jun. 3, 1983, 83 09288

Int. Cl.[4] H05K 5/06; B65D 73/02; H01G 1/06

U.S. Cl. 361—272 **20 Claims**



1. A radiation-hardened casing for an electronic component, comprising three elements, namely a base for receiving the component, a side part, and a cover fixed to the base by means of said side part, at least one of said elements comprising at least two layers of distinct materials, one of them being closer to the component than the other, the atomic charge number of said closer material being low with respect to that of the other, whereby said other layer highly attenuates ionizing radiation to provide said radiation-hardened casing and said closer layer has low electron ignition and shields said electronic component from electrons from said other layer caused by ionizing radiation.

4,639,827

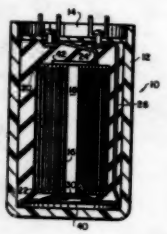
PRESSURE SENSITIVE FAULT INTERRUPTER FOR A MULTI SECTION AC CAPACITOR

Thomas F. Strange, and John W. Carino, both of Columbia, S.C., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 27, 1985, Ser. No. 802,782

Int. Cl.[4] H01G 1/06

U.S. Cl. 361—272 **6 Claims**



1. A multisection AC capacitor having pressure sensitive fault interrupters on each of its capacitor sections, for use as dry metallized film AC motor start or motor run capacitors, wherein said multisection capacitor includes a plurality of metallized foil capacitor sections, each section having a void core, a contact bridge for each electrode of each capacitor section, one contact bridge being on each end of each capacitor section, connecting tabs to said contact bridges, said capacitor sections within said multisection capacitor being connected in parallel through said connecting tabs, a case, potting material securing said capacitor sections and their parallel connections within said case, and connecting terminals for said electrode tabs in a cover for said case, wherein the fault interrupter for each of said capacitor sections comprises:

a diaphragm mechanically and electrically attached to the contact bridge at the base end of said capacitor section;

a tab connection for one electrode from said diaphragm to one of said connecting terminals;

a plug in a form of a tape positioned over the upper end of said core;

said capacitor section with said diaphragm connected thereto being positioned within said case, such that the perimeter of said diaphragm is in firm contact with the base of said case and a void space is left beneath said diaphragm to permit a movement thereof;

a potting material disposed around said capacitor roll within said case such that said capacitor roll and the parallel electrical connections between said capacitor section and at least a second capacitor section is firmly sealed within said case; and

said diaphragm being secured to the bottom of said capacitor roll within said case such that, when a fault occurs, said diaphragm is depressed by gaseous pressure from within its core to break the electrical contact between said diaphragm and its contact bridge, thereby electrically isolating the faulty capacitor section, while leaving the other capacitor sections within said case to function normally.

4,639,828

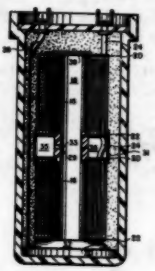
PRESSURE SENSITIVE FAULT CURRENT INTERRUPTER FOR MULTIPLE CAPACITOR DEVICE

Thomas F. Strange, and John W. Carino, both of Columbia, S.C., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 27, 1985, Ser. No. 802,783

Int. Cl.[4] H01G 1/06

U.S. Cl. 361—272 **11 Claims**



1. A multisection capacitor having a pressure sensitive fault interrupter, wherein said capacitor includes a plurality of metallized foil capacitor sections, each of said sections having an interior core void, a contact bridge formed at each end of each capacitor section to serve as the electrodes of said sections, a connecting tab to each of said contact bridges, a case, and potting material to secure said capacitor sections within said case, and connecting terminals for said tabs in a cover for said case, wherein said fault interrupter comprises:

means to attach and separate spatially each of said capacitor sections into a stack, providing an air gap between the bottom of one stacked capacitor section and the top of the adjacent lower capacitor section in said stack and having means to permit the passage of gases to the core of said stack;

means to connect electrically in series said capacitor sections within said stacked capacitor;

at least one sleeve circumferentially surrounding said stack of capacitor sections, at least in the area of said air gap;

means to cover the top of the core of the upper most roll in said stack;

a diaphragm electrically and mechanically attached to the base of the lowest capacitor section in said stack;

a conductive electrode tab connection running from said diaphragm to a terminal on the cover of said case;

a tab connected to the second of said terminals on said cover to the first of said capacitor sections in said stack;

a tab connecting each of the intermediate capacitor sections from the bottom of one section to the top of the adjacent lower section in said stack;

said capacitor sections within said sleeve and with said diaphragm connected thereto being positioned within said case;

potting material disposed around and above said capacitor sections within said case such that the top of said case is sealed and the sides of said case are filled with potting material between the case and said sleeve;

said diaphragm secured to the bottom of said stack of capacitor sections within said case such that said diaphragm may be depressed by gaseous pressure to break the electrical contact between the diaphragm and the contact bridge to which it is secured.

4,639,829

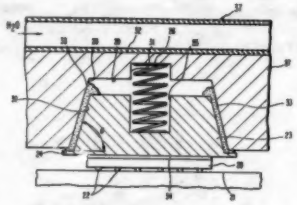
THERMAL CONDUCTION DISC-CHIP COOLING ENHANCEMENT MEANS

Carl D. Ostergren, Montgomery, N.Y., and John A. Paivanas, deceased, late of Williamsville, N.Y. (by Sophia Paivanas, executor), assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 626,554, Jun. 29, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 878,399

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—386 **15 Claims**



1. An apparatus which cools a heat generating semiconductor integrated circuit chip comprising:

a heat conductive truncated conical disc having flat base at one end and a conical portion at the opposite end, said opposite end constituting a truncated end, said base contacting the back surface of said chip;

a heat conductive, thick-walled hat having a tapered inner surface essentially conforming to said disc;

a spring member having upper and lower portions located between said hat and said disc forcing the disc against the chip and forming a narrow peripheral gap between the conical portion of said disc and said tapered surface of said hat; and

conductive thermal grease filled in said peripheral gap providing a low interfacial thermal resistance between the disc and the hat.

4,639,830

PACKAGED ELECTRONIC DEVICE

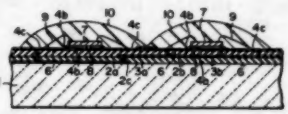
Yoshitaka Fukuoka, Hamuramachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1985, Ser. No. 716,980

Claims priority, application Japan, Mar. 31, 1984, 59-64747

Int. Cl.⁴ H05K *1/03*

U.S. Cl. 361—411 **5 Claims**



1. An electronic device comprising a thick film, multilayer interconnection substrate on which wiring conductor patterns, conductor patterns for connecting input/output leads, conductor patterns for mounting integrated circuit chips and the like and wiring are formed, a noncrystallizing glass formed on said substrate, except for said conductor patterns for connecting input/output leads, said conductor patterns for mounting integrated chips and the like and said wiring, a crystallizing glass layer formed on said noncrystallizing glass layer and a hardening composition potted on said crystallizing glass layer to cover said conductor patterns for connecting input/output leads, said conductor patterns for mounting integrated circuit chips and the like and said wiring.

4,639,831

SENSOR FOR DETECTING AN AMOUNT OF RAIN

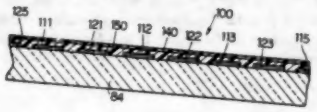
Motomi Iyoda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 4, 1986, Ser. No. 825,991

Claims priority, application Japan, Feb. 15, 1985, 60-20645[U]; Nov. 29, 1985, 60-269830

Int. Cl.⁴ H01G *5/20*; G01R *27/26*

U.S. Cl. 361—286 **20 Claims**



1. A sensor for detecting an amount of rain comprising:

a first conductor member being made of transparent material, the first conductor member including a plurality of first projections, each of the plurality of first projections being spaced from the other of the plurality of first projections;

a second conductor member being made of transparent material, the second conductor member including a plurality of second projections, each of the plurality second projections being spaced from the other of the plurality of second projections, at least one of the plurality of second projections being inserted between two of the plurality of first projections of said first conductor member with a clearance, said first conductor member being insulted electrically from said second conductor member by the clearance; and

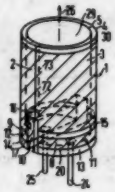
a first insulating member being mounted on said first and second conductor members, said first insulating member being made from a first transparent material.

4,639,832

CONSOLIDATED WINDING ELECTRICAL CAPACITOR AND METHOD FOR THE MANUFACTURE THEREOF

Reinhard Behn, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 862,822
Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517435
Int. Cl.[4] H02B *1/04*; H01G *13/06*, *4/08*
U.S. Cl. 361—306 21 Claims



1. An electrical capacitor, comprising:

a plurality of dielectric bands of stretched plastic film wound together with one another to form a consolidated winding having first and second opposite end faces;

the bands having a regenerably thin metal layer thereon as a coating;

at the first end face of the capacitor an incision being provided in the wound bands, said incision proceeding in a direction of and approximately along a central longitudinal axis of the winding, said incision forming a plurality of individual projections along a first side edge of each band;

metal-free insulating strips being extending longitudinally in a winding direction of and at alternate projections in each band and such that the metal-free insulating strips alternate in aligned projections of adjacent bands;

a depth of the incision being at least sufficient to intersect the metal-free insulating strip and thus electrically isolate an end of those projections having the metal-free insulating strip;

the individual projections of the bands combining to form two major projections at said first end face as a result of the incision; and

ends of the two major projections of the consolidated winding being provided with respective metal contacting layers, a contact surface thus being formed at ends of each major projection.

4,639,833

NEW ELECTRICAL INSULATING OIL AND OIL-FILLED ELECTRICAL APPLIANCES

Atsushi Sato, Tokyo; Keiji Endo, Yokosuka; Shigenobu Kawakami, Ichikawa, and Hideyuki Dohi, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Ltd., Japan

Filed Aug. 12, 1985, Ser. No. 764,873
Claims priority, application Japan, Aug. 18, 1984, 59-172240
Int. Cl.[5] H01G *4/22*; H01B *3/22*
U.S. Cl. 361—315 7 Claims

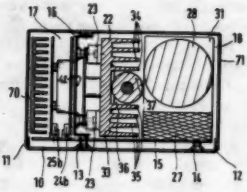
1. An electrical insulating oil which comprises an isomer mixture of dibenzylbenzenes in which the quantity of p-dibenzylbenzene is not more than 10% by weight and the weight ratio of m-dibenzylbenzene/o-dibenzylbenzene is not lower than 3.

4,639,834

POWER SUPPLY

Hartwig Mayer, Neckargerach, Fed. Rep. of Germany, assignor to CEAG Licht- und Stromversorgungstechnik GmbH, Bochum, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 797,001
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1984, 3440756
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 12 Claims



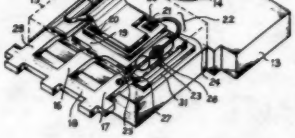
1. Power supply, comprising a housing having a bottom, a partition at said bottom of said housing extended perpendicular to said bottom of said housing as seen in longitudinal direction of said partition subdividing said housing into first and second spaces, electronic modules including switching and control stages exclusively disposed in said first space and at least one other module disposed in said second space, a power transformer fastened to said partition, extended through an opening formed in said partition and having a primary side disposed in said first space in vicinity of said switching stage, and a circuit board spaced from said bottom of said housing having conductor runs forming connecting lines interconnecting said modules.

4,639,835

DEVICE OBTAINED BY MOUNTING TWO SEMICONDUCTOR COMPONENTS WITHIN A SINGLE HOUSING

Francis Daubresse, La Mombralle Choisille, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 15, 1985, Ser. No. 787,063
Claims priority, application France, Oct. 16, 1984, 84 15817
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—392 5 Claims



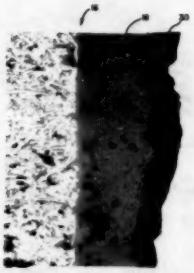
1. Electronic component incorporating two semiconductor components within a common housing, this common housing having at least two outlet connector pins, one of which is electrically connected to a rear face of a first semiconductor chip in order to form a first component, this first chip furthermore comprising at least one first metallized zone on its front face wherein the second component is constituted by a semiconductor chip encapsulated within a sealed housing provided with two outlet electrodes and wherein one of these electrodes is welded to the said metallized zone whereas the other is welded to the second connector pin.

4,639,836

UNENCAPSULATED CHIP CAPACITOR

Harris L. Crowley, Jr., Simpsonville, S.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 19, 1984, Ser. No. 683,796
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—433 3 Claims



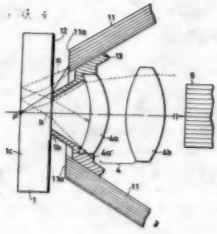
1. A solid unencapsulated electrolytic capacitor of substantially rectangular cross section comprising a tantalum anode body having a relatively short axial lead wire extending from one end and having a peripheral uneven manganese dioxide layer which is mostly covered by metallization but which is exposed at said end of the capacitor body from which the axial lead wire extends; a metal anode strip transverse to said axial lead wire joined thereto and spaced from said end of the capacitor body and being coextensive with an edge region of said end of said capacitor body; a thin, electrically insulative, adherent oxide coating bonded to and interlocking only with the peripheral manganese dioxide layer at said edge region and being formed of microscopic leaflike interlocking particles of oxide.

4,639,837

ILLUMINATING OPTICAL SYSTEM FOR HIGH MAGNIFICATION ENDOSCOPES

Akira Yokota, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,093
Claims priority, application Japan, Mar. 29, 1984, 59-061768
Int. Cl.[4] F21V 7/04
U.S. Cl. 362—32 9 Claims



1. An illuminating optical system for high magnification endoscopes, comprising:

an observation optical system;

a cover glass disposed on the light incident side of said observation optical system;

a light guide disposed around said observation optical system in an annular form tapering toward said cover glass; and

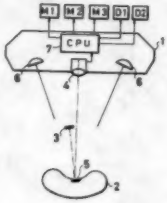
a flare stop defining a predetermined opening and disposed between a light-emitting end of said light guide and an object side surface of said cover glass and having a diameter arranged so that light emitted from an innermost end of said light guide and passing through the a peripheral edge of said opening is led out of said observation optical system after being reflected by the object side surface of said cover glass.

4,639,838

SHADOWLESS LIGHTING EQUIPMENT FOR MEDICAL USE

Yasuhiro Kato, and Mitsuhiro Koyama, both of Tokyo, Japan, assignors to Yamada Iryo Shomei Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 793,979
Claims priority, application Japan, Mar. 30, 1985, 60-65058
Int. Cl.[4] F21M 1/00; A61B 6/08
U.S. Cl. 362—33 10 Claims



1. A shadowless lighting equipment for medical use comprising:

a means for lighting a patient positioned on an operating table;

a means for emitting a wave beam on a predetermined portion of said patient so as to form an irradiation area thereon;

a means for receiving a wave beam reflected from said predetermined portion of said patient and for forming an image of said irradiation area;

a means for comparing received information regarding an image forming position by said image forming means with received information regarding a light concentration position of said lighting means and for generating an output containing information regarding a positional difference between said image forming position and said light concentration position when said former position is shifted from said later position; and

a means for driving said lighting means in response to said output from said comparing means until said light concentration position is the same as said image forming position.

4,639,839

VEHICULAR LIGHTING DEVICE HAVING A POWER DRIVEN LAMP COVER

Kenji Miyazawa, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,865
Claims priority, application Japan, Aug. 9, 1985, 60-175492
Int. Cl.[4] F21V 17/00
U.S. Cl. 362—64 8 Claims

1. A lighting device for vehicular use, comprising:

(a) a lamp assembly comprising:

(1) a lamp housing having a front side; and

(2) a light source within the lamp housing for providing illumination through the front side thereof;

(b) a lamp cover mounted to the lamp housing of the lamp assembly for pivotal motion between an open position, where the lamp cover uncovers the front side of the lamp

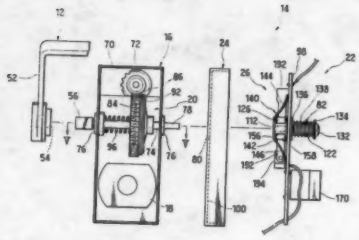
housing, and a closed position where the lamp cover covers the front side of the lamp housing;

(c) a lamp cover drive mechanism mounted to the lamp housing of the lamp assembly for pivoting the lamp cover between the open and closed positions, the lamp cover drive mechanism comprising:

(1) a reversible electric drive motor;

(2) a drive shaft coupled to the lamp cover for pivoting the same between the open and closed positions by being driven by the drive motor; and

(3) a torque limiter interposed between the drive motor and the drive shaft for protecting the drive motor from overloading, the torque limiter normally causing the drive motor to drive the drive shaft and permitting the drive motor to rotate independently of the drive shaft upon jamming of the lamp cover; and



(d) an electric control circuit comprising:

(1) a lamp/cover control switch;

(2) first circuit means responsive to the actuation of the lamp/cover control switch for causing the drive motor of the lamp cover drive mechanism to rotate in a predetermined direction to an extent necessary for pivoting the lamp cover from the closed to the open position, the first circuit means being further responsive to the deactuation of the lamp/cover control switch for causing the drive motor to rotate in an opposite direction to an extent necessary for pivoting the lamp cover from the open to to the closed position; and

(3) second circuit means associated with the first circuit means for lighting up the light source of the lamp assembly when the lamp cover is in the open position.

4,639,840

VEHICLE HEADLAMP ASSEMBLY

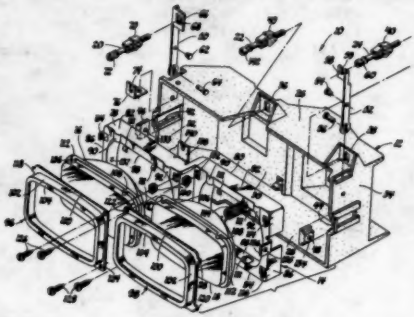
David R. McMahan, and Richard W. Nicholas, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 677,697, Dec. 3, 1984, abandoned. This application Jun. 10, 1985, Ser. No. 743,088

Int. Cl.[4] B60Q *1/04*

U.S. Cl. 362—80 **3 Claims**

1. A headlamp assembly for a vehicle body having a front end, said headlamp assembly adapted to be mounted to said vehicle body at the front end thereof and including a support bracket providing adjustable aiming movement of a headlamp unit, said headlamp unit being rectangular in configuration and having a peripheral flange provided with an outer vertical surface, said outer vertical surface having three aiming pads that define an aiming plane, said support bracket having a front face, three projections connected to said front face of said support bracket for defining a substantially vertically orientated seating plane, a retainer for maintaining said headlamp unit in said support bracket, said retainer having an outer end and an inner end, said outer end being formed with a radially inwardly extending rim portion and having the inner end of said retainer formed with an edge located in a plane parallel to the plane of said rim portion, fastener means for connecting said retainer to said support bracket so that said edge of said retainer contacts said three projections of said support bracket so as to cause said plane of said rim portion to be located parallel to said seating plane of said three projections, and spring means between said support bracket and said headlamp



unit for biasing the latter towards said retainer so that said aiming pads of said headlamp unit are seated on said rim portion of said retainer to automatically aim the headlamp unit without requiring readjustment of said support bracket.

4,639,841

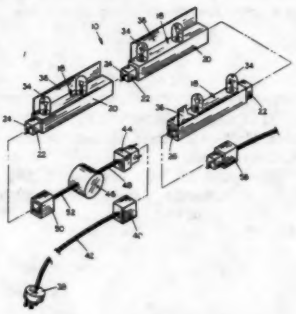
MODULAR LIGHTING SYSTEM

Charles B. Salestrom, No. 2 Seminole La., and Kenneth E. Anderson, No. 9 N. Lake Dr., both of Kearney, Nebr. 68847

Filed Jan. 13, 1986, Ser. No. 817,988

Int. Cl.[4] F21M *33/00*

U.S. Cl. 362—227 **7 Claims**



1. A modular lighting system, comprising,

a plurality of elongated light modules selectively connected in an end-to-end relationship,

each of said elongated light modules having a male plug portion at one end thereof and a female plug portion at its other end,

first electric circuit means electrically connecting said male and female plug portions,

a plurality of light sockets provided on each of said modules and being electrically connected to said first electric circuit means,

a light bulb means in each of said light sockets,

the male plug portion of each of said modules adapted to be:

(1) received by the female plug portion of the adjacent module, or:

(2) electrically connected to a source of electrical energy, or:

(3) electrically connected to a female plug portion of a module separated therefrom whereby the length of the

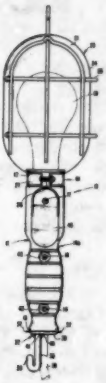
modular lighting system may be varied by the use of more or less modules.

4,639,842

TROUBLE LIGHT WITH ROTATABLE ATTACHING MEANS

James E. Upchurch, Indianapolis, Ind., assignor to Woods Wire Products, Inc., Carmel, Ind.

Filed Oct. 28, 1985, Ser. No. 792,029
Int. Cl.[4] F21V *15/00*
U.S. Cl. 362—376 **16 Claims**



1. A light comprising:

a generally cylindrical, hollow, elongated handle shaped to be comfortably held in the hand and having a distal end and a proximate end, said handle having a first longitudinal axis;

an incandescent light bulb socket located in the distal end;

said distal end being open and internally sized to receive the incandescent light bulb socket, said proximate end having an end wall enclosing said proximate end;

switch means electrically connected to said incandescent light bulb socket for controlling the flow of electricity to said incandescent light bulb socket;

wiring means connectable to an external electric source, designed and arranged to supply electricity to said switch means;

a two-piece cage sized to permit an incandescent light bulb to be inserted therein, said cage having a first piece being manufactured of opaque material and being designed and arranged to protect an incandescent light bulb inserted in said socket and reflect the light emitted therefrom, said cage having a second piece and being of a grid design to allow light from said bulb to emit therethrough;

an attachment means for attaching said cage to the distal end of said handle;

a hanging means for hanging said light; and,

rotatable mounting means for rotatably mounting the hanging means to the end wall and configured to allow the light assembly to be hung with said electrical socket therebeneath opening downward wherein the rotatable mounting means for rotatably mounting the hanging means comprises:

receiving means including a hole in the end wall enclosing the proximate end of said handle, sized to allow an electrical cord to pass therethrough, said hole being concentric about the longitudinal axis of the handle; and further comprising

a first disc and a second disc;

a cylindrical intermediate portion integrally joining said first disc and said second disc to form a rotation assembly,

said rotation assembly having a second longitudinal axis and being concentric about said second axis;

said first disc and second disc having outside diameters greater than the outside diameter of said cylindrical intermediate portion;

said first disc being sized to fit within the inside diameter of said handle, said cylindrical intermediate portion having an outside diameter sized to fit within the hole in the proximate end of said handle, said second disc having an outside diameter which approximates the outside diameter of said handle, said cylindrical intermediate portion having a length slightly greater than the thickness of the end wall enclosing the proximate end of said handle to allow for the sides of the first disc and second disc to be in frictional contact with the end wall of said handle; and,

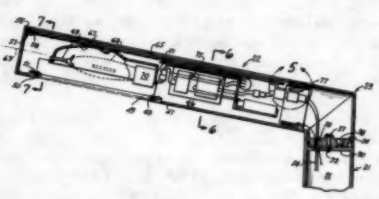
said rotation assembly seated in the hole in the proximate end of said handle so that the sides of the first disc and second disc are in frictional contact with the wall enclosing the proximate end of said handle.

4,639,843

LUMINAIRE

Wayne W. Compton, Chino Hills, Calif., assignor to Kidde Consumer Durables, Corporation, City of Industry, Calif.

Filed Apr. 10, 1985, Ser. No. 722,125
Int. Cl.[4] F21V *19/02*
U.S. Cl. 362—431 **12 Claims**



1. A luminaire comprising:

a post;

an arm supported by said post, said arm comprising: a body having an internal chamber; a peripheral wall; an aperture formed through said wall; and light transmissive means closing said aperture;

an opening through said body giving access to said chamber;

a removable closure adapted to close said opening;

track means in said chamber said track means having an axis;

mount means in said chamber adapted to be releasably retained by said track means and slidable along said axis;

reflector means mounted to said mount means facing toward said aperture and adapted to mount a lamp;

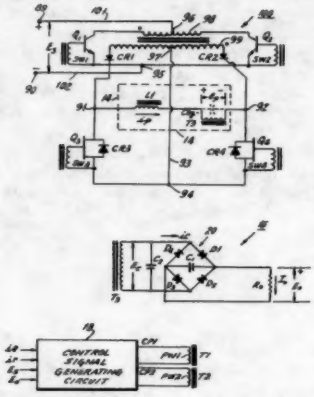
circuit means mounted to said mount means and connected to said lamp; and

electrical disconnect means between said circuit means and a source of electrical current, said disconnect means including a first connector mounted to said arm and a second connector mounted to said mount means, said connectors being axially aligned, whereby to make a circuit connection when said mount means is moved so as to join them, and to break said connection when said mount means is moved sufficiently to separate them, after which the mount means may be released from said track means, said mount means, with the reflector and lamps mounted to it, being insertable into said chamber through said opening when said closure does not close said opening.

4,639,844
RESONANT CURRENT DRIVEN POWER SOURCE FOR LOW INPUT VOLTAGES

George C. Gallios, Setauket, and Charles Lien, Huntington, both of N.Y., assignors to Venus Scientific Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 417,465, Sep. 13, 1982, Pat. No. 4,475,149. This application Aug. 6, 1984, Ser. No. 637,779
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—17 21 Claims



1. A power source comprising:

an LC circuit including an inductor and a capacitor electrically coupled to one another;

an input inverter circuit for converting an input DC voltage into an AC voltage having substantially no DC components, said input inverter circuit applying said AC voltage across said LC circuit in a manner which causes said inductor and capacitor to resonate with one another, a resonant AC voltaage thereby appearing across said capacitor; and

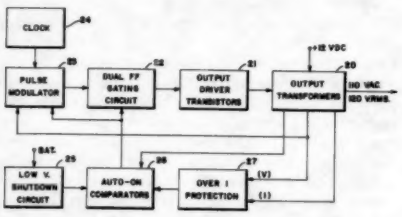
an output circuit for applying power from said inverter circuit to a load;

said input inverter including a step-up transformer having a center-tapped primary to which said DC voltage is applied and having a center-tapped secondary through which said AC voltage is applied across said LC circuit for stepping up the input DC voltage to improve the operating efficiency of the power source for low input voltages.

4,639,845
VOLTAGE INVERTER

Eric G. Persson, Minneapolis, and Ronald D. Veith, St. Peter, both of Minn., assignors to GTO Electronics, St. Peter, Minn.

Filed May 11, 1984, Ser. No. 609,470
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—26 5 Claims



1. A voltage inverter comprising:

clocking means for producing a clock signal;

output drive transistors for switching DC voltage in response to first and second drive signals;

primary output transformer means connected to said output drive transistors for commutation of said switched DC voltage through said transformer;

power output transformer means controlled by said primary transformer means for commutating of DC power through to an inverter output to produce an AC voltage;

voltage sensing means connected to said power output transformer means for producing a first feedback signal indicative of the magnitude of the AC voltage output;

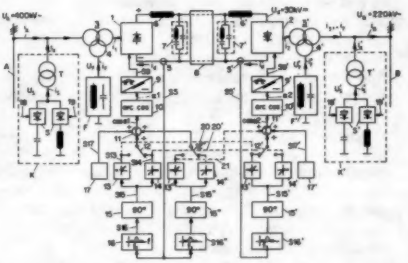
pulse modulation means receiving said clock signal and said first feedback signal and operative in response thereto for producing first and second square wave control signals, the phase relationship between said control signals being varied according to the magnitude of the AC voltage output; and

gating circuit means receiving said first and second square wave control signals for producing said first and second drive signals such that the first drive signal always has a greater active duty cycle than the second drive signal, causing said output drive transistors to be simultaneously active for the period of overlap between the active duty cycles of said first and second drive signals whereby the magnetic field in said primary output transformer is dynamically switched suppressing voltage spikes on said inverter output.

4,639,846
METHOD AND COMPENSATING DEVICE FOR COMPENSATING CURRENT OSCILLATIONS

Peter Dähler, Remigen; Peter Neidhart, Untersiggenthal, both of Switzerland; Kadry Sadek, Lauchringen, Fed. Rep. of Germany, and Herbert Stemmler, Kirchdorf, Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 19, 1986, Ser. No. 830,721
Claims priority, application Switzerland, Aug. 16, 1985, 3547/85
Int. Cl.[4] H02J *1/02*
U.S. Cl. 363—39 9 Claims



1. Method for compensating current oscillations in a direct-current link circuit between at least one first static converter or link-circuit rectifier (1) and at least one second static converter or link-circuit inverter (2), particularly for compensating current oscillations in a high-voltage direct-current transmission system,

(a) in which arrangement at least one direct-current link-circuit current signal (S5, S5'), which characterises the current oscillations, is detected and

(b) an inverter is controlled in dependence on this direct-current link-circuit current signal, with the aim of compensating the current oscillations,

characterised in that,

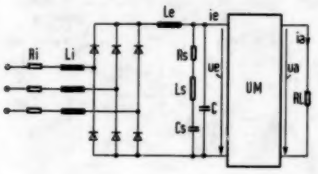
(c) additionally also at least one phase control angle (α 1) of the link-circuit rectifier (1) is controlled in dependence on at least one direct-current link-circuit current signal.

4,639,847

CIRCUIT ARRANGEMENT FOR CONTROLLED POWER SUPPLY DEVICES PARTICULARLY FOR AUTOCONVERTERS

Bogdan Brakus, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 731,740
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 3420908
Int. Cl.[4] H02M 1/14
U.S. Cl. 363—46 4 Claims



1. A circuit for a controlled power supply device connectable to a feed network, said device having a controlled circuit portion exhibiting a negative input impedance in at least a portion of its operating range, and an input circuit portion, said input circuit portion being a filter having at least a series inductance and a shunt capacitance for suppressing disruptions to the feed network, said circuit comprising:

a series resonant circuit having a further inductance, a further capacitance and an ohmic resistance connected in a shunt branch of said filter, said series resonant circuit having a resonant frequency substantially equal to the resonant frequency of said filter formed by said series inductance and said shunt capacitance;

the capacitance of the filter being larger than the capacitance of the series resonant circuit and the inductance of the filter being smaller than the inductance of the series resonant circuit such that the impedance of the combination of said filter and said series resonant circuit has minimum at said resonant frequency, and further has respective maxima at a lower resonant frequency defined by the inductance of the filter and the capacitance of the series resonant circuit, and at a higher resonant frequency defined by the capacitance of the filter and the inductance of the series resonant circuit; and

the ohmic damping resistance of the series resonant circuit has value such that at both said upper and lower resonant frequencies undamping of said controlled circuit portion is overcompensated by said negative input impedance.

4,639,848

METHOD AND SYSTEM FOR CONTROLLING AN AC-DC CONVERTER SYSTEM

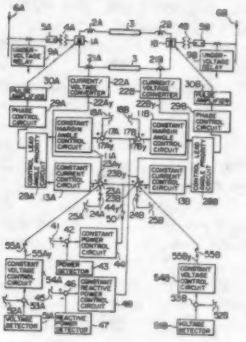
Takami Sakai, Akishima, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 22, 1985, Ser. No. 736,781
Claims priority, application Japan, May 24, 1984, 59-103614
Int. Cl.[4] H02H 7/00
U.S. Cl. 363—51 7 Claims

1. A method for controlling an AC-DC converter system including a plurality of AC-DC converters having respective AC terminals connected to separate ones of a plurality of AC power systems and having respective DC terminals connected to each other, comprising the steps of:

detecting a fault in any one of said plurality of AC power systems; and

adjusting, when a fault occurs in a faulty one of the plurality of AC power systems, the DC current of the AC-DC converter which is connected to a sound AC power system of said plurality of power systems in such a manner as to maintain the AC voltage of the AC-DC converter



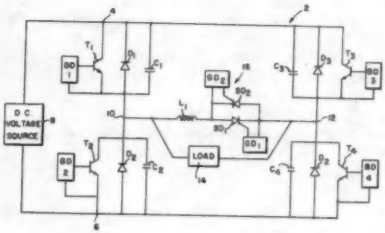
which is connected to said sound AC power system at a desired value.

4,639,849

SNUBBER CIRCUIT FOR H.F. BRIDGE CONVERTER

Zbigniew Noworolski, Willowvale, and Jerzy Ferens, Toronto, both of Canada, assignors to International Exide Electronics/-Corporation, Raleigh, N.C.

Filed May 8, 1985, Ser. No. 731,895
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 3 Claims



1. A high-frequency bridge converter circuit for converting a direct-current input voltage to a high-frequency alternating-current output voltage, comprising

(a) a plurality of current-conducting first switching devices (T_1–T_4) each including a control electrode and a pair of power circuit electrodes;

(b) means connecting said first switching devices to define a four-armed bridge circuit having a pair of input terminals adapted for connection across a direct-current voltage source, and a pair of output terminals adapted for connection across a load, the power circuit electrodes of first and second pairs of said first switching devices T_1, T_2, T_3, T_4) being connected in series to define first and second current paths extending in the same direction between said input terminals, respectively, said output terminals being located at the junctions between the switching devices of each pair, respectively, said bridge circuit also including

(1) a plurality of capacitors (C_1–C_4) connected across the power circuit electrodes of said switching devices, respectively;

(2) a plurality of blocking diodes (D_1–D_4) connected across said switching devices, respectively; and

(3) first control means (BD_1–BD_4) for alternately switching the pairs of first switching devices contained in diagonally opposite arms (T_1, T_4; T_2, T_3) of said bridge

circuit between oppositely conducting and non-conducting conditions, respectively, said first control means being operable to cause one arm to be conductive at a time (t_5,t_8) delayed from the time (t_4,t_7) at which the other arm is caused to be non-conductive, respectively, and;

(c) snubber circuit means connected between said bridge output terminals for controlling the discharging of said capacitors during the operation of said first switching devices, respectively, said snubber circuit means including

(1) an inductor (L_1) connected at one end with one of said output terminals,

(2) means including a pair of parallel-connected oppositely-poled second switching means with reverse blocking characteristics (SD_1, SD_2) connecting the other end of said inductor with the other output terminal, and

(3) second control means (GD_1, GD_2) for operating said second switching means to connect in series with said inductor those capacitors (C_1, C_4; C_2, C_3) that are charged when the state of conduction of the arms of said bridge circuit is reversed, respectively, said second control means being operable at the times (t_4, t_7) at which the arms are switched to their non-conductive conditions, respectively.

4,639,850

POWER CONVERTER DEVICE

Takeaki Asaeda, Kobe; Toru Nakamura, Akashi, and Takashi Yutani, Kobe, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

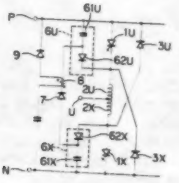
PCT No. PCT/JP84/00144, § 371 Date Sep. 20, 1984, § 102(e) Date Sep. 20, 1984, PCT Pub. No. WO84/04004, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 28, 1984, Ser. No. 650,370

Claims priority, application Japan, Mar. 29, 1983, 58-55596

Int. Cl.⁴ H02H *7/122*

U.S. Cl. 363—58 **4 Claims**



1. A power conversion device for converting D-C input power across a pair of electrodes of a D-C bus into an A-C load power across a pair of reactors, said device comprising:

self-extinguishing switching elements connected in series across said electrodes;

corresponding snubbers connected in parallel with said switching elements, each of said snubbers having a capacitor connected to one of said electrodes and a diode in series with said capacitor;

a capacitor-discharging circuit having a diode and connected across the diodes of said snubbers providing a current path for discharging said snubbers;

a power source feedback circuit for returning discharging current from said snubbers to said source, said feedback circuit including:

a diode and a current transformer in said discharge circuit and connected across said electrodes of said bus.

4,639,851

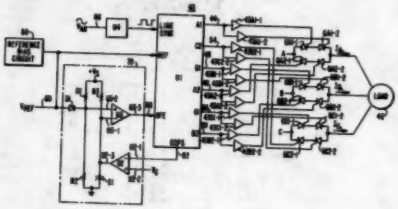
METHOD AND APPARATUS FOR FIRING ANGLE CONTROL OF SERIES CONNECTED THYRISTOR SWITCHES

Frederick O. Johnson, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,174

Int. Cl.⁴ H02M *5/257*

U.S. Cl. 363—164 **6 Claims**



1. In an AC firing angle control circuit having as inputs thereto a reference control signal and a gate firing enable signal for producing a fixed frequency, variable voltage output to an electrical load having a unity or lagging power factor via a thyristor string in each phase having at least two series-connected thyristors with the firing angle control circuit using coincident sequential gate firing signals for the phase angle firing of the thyristor string, the firing angle control being responsive to the reference control signal for controlling the delay for the phase angle firing of the thyristor: with the thyristors being responsive to the gate firing signals only when the gate firing enable signal is present, a method for preventing voltage imbalance across the series connected thyristors during reversed voltage operation thereof, comprising:

controlling the phase angle firing of the thyristors as a function of the reference control signal such that the delay for the phase angle firing advances toward 0° as the reference signal increases toward a maximum value with the maximum delay in phase angle corresponding to the minimum value for the reference signal that is necessary for coincident sequential gate firing to occur thereby providing current to the electrical load; and

controlling the gate firing enable signal as a function of the reference signal such that, as the reference signal decreases, the length of presence of the gate enable signal decreases so that, whenever the delay in the phase angle firing determined by the reference signal would cause the string of thyristors to be fired at a time when the thyristors are reversed biased by the applied phase voltage, the gate firing enable signal is removed until the next occurrence of coincident sequential firing for the string of thyristors.

4,639,852

PROCESS CONTROL SYSTEM

Takehiko Motomiya, Tokyo, Japan, assignor to Ohkura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,407

Claims priority, application Japan, Nov. 24, 1983, 58-221139

Int. Cl.⁴ G06F *15/46*

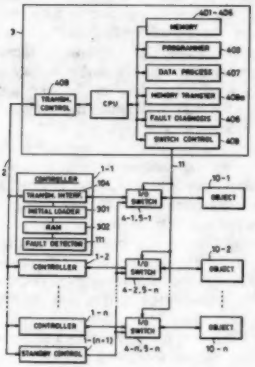
U.S. Cl. 364—138 **4 Claims**

1. A process control system for controlling process variables of a process at different portions thereof, the process control system comprising:

a plurality of controllers coupled to a process at different portions thereof to control process variables thereat, each controller having, coupled together, an initial load means for loading, an input interface means for receiving input signals representing measured value of a process variable being controlled, an output interface means for sending out output signals to a corresponding portion of the pro-

cess, a random access memory (RAM) means, a central processing unit (CPU), a fault detector circuit producing a detection signal upon detection of controller runaway, and a transmission interface, said RAM means for storing a control program and control information including a set point of the process variable being controlled and the measured value of said process variable, said CPU running said control program so as to produce the output signals based on said input signals and said control information, said output signals acting on said portion of the process so as to minimize difference between said set point and said measured value of the variable being controlled;

a supervisory computer having, coupled together, a memory means for storing the control informations of said controllers, said control informations covering said set points of the variables being controlled, operating modules for effecting mathematical operations, operating loops, operating modes, parameters of the controllers and said detection signals, said operating modes being formulated by said supervisory computer by selectively combining said operating modules and said parameters so as to selectively produce different combinations of on-off, proportional, derivative, and integral control actions; a programmer means for automatically editing control programs for said



controllers based on said control information; and a transmission control means controlling signal transmission both between said transmission interface of the controllers and said memory means and between said transmission interface of the controllers and said programmer means; and

transmission lines extending between said transmission interfaces of the controllers and said transmission control means of the supervisory computer, whereby, said supervisory computer selectively transmits initial control programs and initial parameters to individual controllers for loading therein through said initial loader means so as to start said controllers with the initially loaded control programs and parameters, while during operation each controller samples relevant control parameters through said means for receiving input signals and transmits the sampled parameters to said supervisory computer so as to update the control parameters stored in the memory means thereof, and in response to the detection signal said programmer means of the supervisory computer automatically edits the control program of the runaway-detected controller immediately before the runaway based on the updated control information and said transmission control means of the supervisory computer transmits the thus edited control program to the runaway-detected controller.

4,639,853

TIME-DISCRETE ADAPTIVE SWITCHING ON-OFF CONTROLLER

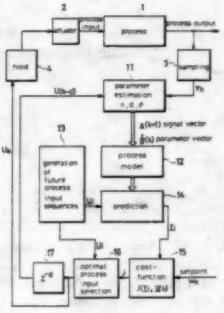
Heinrich Rake; Ulrich Hoffmann; Ulrich Müller; Rudolf Breddermann, all of Aachen, and Rainer Blumbach, Würselen, all of Fed. Rep. of Germany, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 1, 1984, Ser. No. 616,196

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320224

Int. Cl.[4] G05B *13/04, 13/02, 13/00, 21/02*

U.S. Cl. 364—149 **15 Claims**



14. An apparatus used in the transient phase of a process to be controlled comprising:

means for generating a process input sequence within which only one switching of an actuating signal occurs, the switching occurring after a first sampling interval of the process input sequence,

means for predicting a process output sequence over a number of future sampling intervals as a response to the process input sequence generated that is applied to a discrete-time linear process model, and further predicting the extremal point of the process output sequence, and

means for selecting an actuating signal for the next sampling interval from the process input sequence generated, if a system deviation in the extremal point of the future process output sequence is of such a nature that no overshooting of the process output occurs, and for selecting, where overshooting of a process occurs, an actuating signal for the next sampling interval that results from a switching of such actuating signal to its counteracting level that is for the first sampling interval of the process input sequence generated.

4,639,854

HIGH GAIN FEEDBACK CONTROL SYSTEM

Kazuo Kurokawa, Ichigayadaimachi, and Tadashi Tanaka, Ueda, both of Japan, assignors to Sanyo Denki Co. Ltd., Kitaotsuka, Japan

Filed Jan. 25, 1984, Ser. No. 573,837

Claims priority, application Japan, Feb. 1, 1983, 58-15155

Int. Cl.[4] G05B *13/02*

U.S. Cl. 364—157 **5 Claims**

1. A feedback control system comprising:

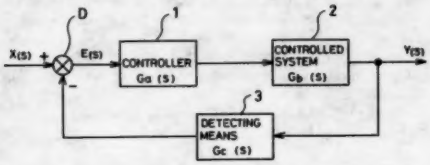
at least one closed loop control system having n poles for a loop transfer function with n being a positive integer of 2 or more;

said closed loop control system comprising a controller having a high gain, said controller receiving a deviation signal E(s) and amplifying said deviation signal;

a controlled system controlled depending upon an output from said controller;

a detecting means for detecting a controlled variable Y(s) from said controlled system; and

a summing point for providing said deviation signal E(s) by summing a reference input X(s) with a detecting output from said detecting means;



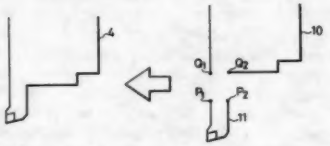
wherein said detecting means has a transfer function determined so as to allow said loop transfer function to have (n−1) zero points.

4,639,855

TOOL DISPLAY METHOD FOR LATHE EQUIPPED WITH NUMERICAL CONTROL UNIT

Katsuhide Sekikawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,185
Claims priority, application Japan, Nov. 7, 1983, 58-208618
Int. Cl.⁴ G06F *15/00*
U.S. Cl. 364—188 **7 Claims**



1. A tool display method for a lathe equipped with a numerical control unit which comprises a numerical control unit body for controlling said lathe and a configuration display device connected to said control unit body for displaying the configuration of a tool, which method comprises the steps of:

storing a plurality of tool configuration types in a memory in said numerical control unit body;

storing in said memory dimensions of configurations of cutters as functions with respect to a reference dimension according to the tool configuration types thus stored;

inputting a plurality of items of tool data by operating an input section in said numerical control unit body;

selecting an optimum tool configuration type according to the tool data thus inputted;

calculating in an arithmetic section in said numerical control unit dimensions of a cutter configuration according to said tool data with reference to said optimum tool configuration type thus selected;

determining according to said tool data a tool mounting direction and whether or not a tool edge should be displayed; and

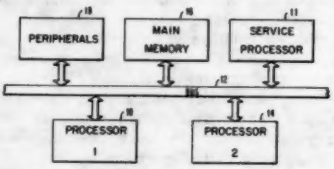
determining a tool configuration according to said selected optimum tool configuration type, the calculated dimensions of said cutter configuration and said tool mounting direction and according to whether or not the edge of said tool should be displayed, synthesizing said tool configuration and a tool post configuration into a turret configuration, and displaying said turret configuration on said configuration display device.

4,639,856

DUAL STREAM PROCESSOR APPARATUS

John Hrustich, Endicott, and Wayne R. Sitler, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,748
Int. Cl.⁴ G06F *11/00*
U.S. Cl. 364—200 **3 Claims**



1. In a multiprocessor computer system including a plurality of processors, service processor means connected to the plurality of processors for developing an output signal in the event a failure occurs within one of the processors, a main memory connected to the plurality of processors for supplyihg instructions and data, I-module means disposed within each of the processors for preventing a current instruction from being re-executed and a next instruction from being executed in response to a trap signal, and control means disposed within each of the processors for controlling the operation of the processor, remaining ones of said plurality of processors attempting to search for data in the one processor prior to searching for the data in the main memory, said control means of the one processor comprising:

first means connected to said service processor means for transmitting a special signal from the one processor to the remaining ones of said plurality of processors in the event said failure occurs within the one processor in response to said output signal from said service processor means, said remaining ones of said plurality of processors neglecting to search for the data in the one processor and searching for the data in the main memory in response to said special signal from said first means of said one processor, said first means including,

latch circuit means for generating a set signal in response to said output signal from said service processor means, and

gate means for generating an output signal in response to said set signal,

said first means transmitting said special signal in response to said output signal from said gate means.

4,639,857

DIGITAL DATA PROCESSOR INCORPORATING AN ORTHOGONALLY CONNECTED LOGIC CELL ARRAY

John V. McCanny, and John G. McWhirter, both of Malvern, England, assignors to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 406,916, Aug. 10, 1982, Pat. No. 4,533,993. This application May 6, 1985, Ser. No. 730,941
Claims priority, application United Kingdom, Aug. 18, 1981, 8125222
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—200 **10 Claims**

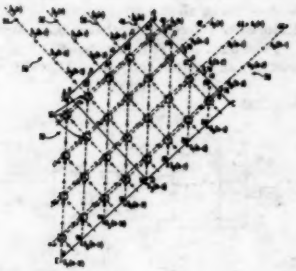
1. A digital data processor for performing a multiplication operation involving generation and accumulation of bit-level product terms, and including:

(1) a two dimensional array of bit level arithmetic logic cells arranged in rows and columns, each cell being arranged to receive input multiplicand, carry and cumulative sum bits and output new carry and cumulative sum bits;

(2) a plurality of storing means each arranged for input and subsequent output of successive bits from a respective cell output in response to clock signal activation;

(3) cell interconnection lines arranged to connect each cell via respective storing means to its immediate row and column neighbors, said lines providing routes through the array for propagation of all input multiplicand bits;

(4) digital data input means for multiplicand input to the array in response to clock signal activation, said input means being arranged to provide input data with relative delays;



(5) clocking means for sole control of calculation execution, the clocking means being arranged to activate the storing means and digital data input means appropriately to synchronize input of successive combinations of bits to each cell, and the storing means, cell interconnection lines, digital data input means and clocking means being arranged in combination so that cumulative sum contributions to output results are accumulated in cascade along routes through the array via successive logic cells;

(6) array output lines connected to respective cell outputs appropriate to provide cumulative sums resulting from cell logic operations cascaded through the array.

4,639,858

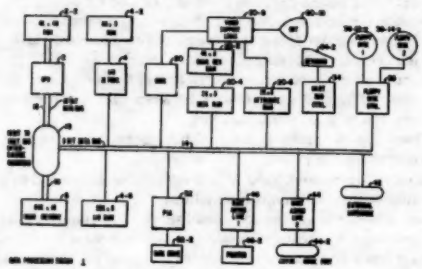
APPARATUS AND METHOD FOR TESTING AND VERIFYING THE REFRESH LOGIC OF DYNAMIC MOS MEMORIES

Thomas L. Murray, Jr., Merrimack, N.H., and Thomas O. Holtey, Newton, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jul. 5, 1983, Ser. No. 510,711

Int. Cl.[4] G06F *13/00*; G11C *7/00*

U.S. Cl. 364—200 **8 Claims**



1. A data processing system includes a plurality of metal oxide semiconductor (MOS) dynamic random access memories, each of said plurality of MOS dynamic random access memories having a plurality of MOS chips, each of said plurality of MOS chips storing a plurality of binary bits, each of said binary bits being identified by a row address and a column address, said system further including apparatus for testing and verifying logic which refreshes bit positions of said plurality of MOS chips, said apparatus comprising:

timing means for generating an interrupt signal which cycles between a first and a second state at a predetermined rate;

central processor unit (CPU) means having first means responsive to said interrupt signal at each said first state for generating a plurality of row address signals applied to the plurality of MOS chips for refreshing said bit positions of said plurality of MOS chips, and said CPU means having second means responsive to said interrupt signal at each said first state for generating a refresh signal;

microprocessor means including third means for counting the number of times said refresh signal is generated and generating a refresh count signal in a first state after counting a first predetermined number of said refresh signals;

said microprocessor means further including fourth means coupled to said third means for testing said refresh count signal to determine if it is in said first or a second state and fifth means coupled to said fourth means for storing a test count of the number of times said refresh count signal was in the second state when tested by said fourth means;

said microprocessor means further including sixth means coupled to said third means for comparing said test count with a second predetermined number, and including seventh means coupled to said sixth means for comparing said test count with a third predetermined number, and eighth means coupled to said sixth and said seventh means for indicating a failure when said test count is less than said second predetermined number or greater than said third predetermined number.

4,639,859

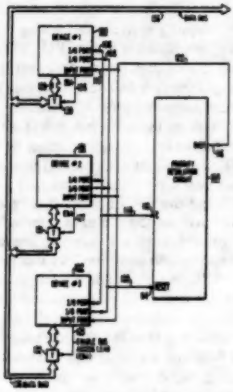
PRIORITY ARBITRATION LOGIC FOR A MULTI-MASTER BUS SYSTEM

Russell G. Ott, Cranford Township, Union County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 24, 1984, Ser. No. 613,410

Int. Cl.[4] G06F *15/16*; H04Q *9/00*

U.S. Cl. 364—200 **8 Claims**



1. In a system comprising a plurality of devices none, one, some or all of which may be contending for use of a common data bus, a priority resolution circuit for determining which particular device of said plurality of devices shall obtain control of the common data bus, comprising:

first logic means common to all of said devices, comprising:

a first common control bus having one level signal thereon when none of said devices is attempting to obtain control

of the common data bus and another level signal thereon when any one or ones of said devices is/are attempting to obtain control of said common data bus; and

a second common control bus having one level signal thereon when none of said devices has control of said common data bus and another level signal thereon when one of said devices has control of said common data bus;

each of said devices including said particular device comprising second logic means for testing the signal level on said first common control bus and responsive to said one level signal on said first common control bus to then test the signal level on said second common control bus;

the said second logic means of said particular device being further responsive to said another level signal on said second common control bus to obtain control of said common data bus.

4,639,860

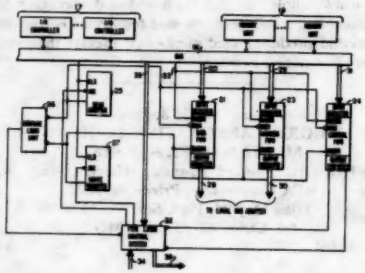
WRAP-AROUND LOGIC FOR INTERPROCESSOR COMMUNICATIONS

Arthur Peters, Sudbury, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 377,300, May 12, 1982, abandoned. This application Dec. 6, 1985, Ser. No. 806,123

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **4 Claims**



1. A data processing system comprising a plurality of units including a central processor unit (CPU), a subordinate processor unit (SUB), a local bus coupled to said (CPU) and (SUB), a local bus adapter coupled to said local bus for the transfer of information in a primary mode of operation directly between the CPU and SUB, an input output unit (I/O) for issuing input output commands to transfer information from the I/O to said CPU and SUB, a common bus coupled to said (I/O) CPU and SUB for providing a path for the transfer of information between the I/O and the CPU and SUB, a common bus adapter including wrap-around logic means coupled to said local bus adapter and to said common bus for capturing information being transferred on the common bus and directing that information to the CPU and SUB, and also for transferring information from the CPU and SUB to the common bus, and said wrap-around logic means in said local bus and common bus adapters for inhibiting transfer of information directly between the CPU and SUB and for returning information from the CPU or SUB utilizing input output commands issued by said I/O, which information has been previously transferred to the common bus under commands issued by said CPU, back through the common bus adapter to the CPU or SUB in a secondary mode of operation;

whereby there is provided an alternate route for issuing instructions from the CPU to the SUB, by having the CPU and its SUBs coupled by dedicated private interfaces, with instructions issued directly from the CPU to these interfaces, and whereby the wrap-around logic means detects information that is not to be transferred to the I/O units and accordingly reroutes it back to the CPU or its SUBs.

4,639,861

INTERFACE CONTROLLING BIDIRECTIONAL DATA TRANSFER BETWEEN A SYNCHRONOUS AND AN ASYNCHRONOUS BUS

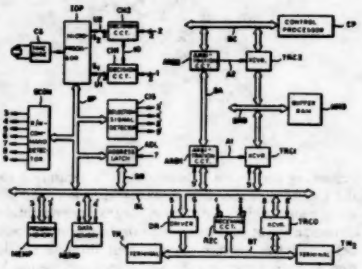
Silvano Appiano, Montafia d'Asti; Paolo Destefanis, and Cesare Poggio, both of Turin, all of Italy, assignors to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jan. 20, 1984, Ser. No. 572,579

Claims priority, application Italy, Jan. 21, 1983, 67070 A/83

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—200 **3 Claims**



1. In a data-handling system wherein a processing unit dialoguing with a plurality of terminals carries out a main program in a temporally uncorrelated manner, with emission and acquisition of data by said processing unit at irregular intervals via an asynchronic two-way bus to each of said terminals, each of said terminals emitting periodically recurring access requests over a common synchronous two-way bus to said processing unit with a minimum recurrence period accommodating a data transfer involving each of said terminals.

the combination therewith of an interface with input/output connections to both said asynchronous bus and said synchronous bus, whereby said interface controls bidirectional transfer of data between said asynchronous bus and said synchronous bus to avoid congestion, said interface comprising:

receiving means connected to said synchronous bus for detecting access requests from any of said terminals;

decision means connected to said receiving means for establishing an order of succession among simultaneously arriving requests from said plurality of terminals;

microprocessing means connected to said decision means for controlling said data transfer between said synchronous bus and said asynchronous bus;

a two-way synchronous internal bus connected to said microprocessing means;

memory means connected to said asynchronous bus and said two-way synchronous internal bus;

first arbitration means for establishing communication of said memory means with said two-way synchronous internal bus in response to instructions from said microprocessing means with simultaneous cutoff of said memory means from said asynchronous bus; and

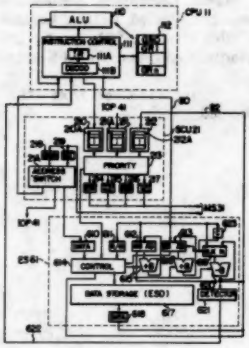
second arbitration means for establishing communication of said memor[illegible]ns with said asynchronous bus in response to [illegible]uctions from said processing unit, with simultaneous cutoff of said memory means from said two-way synchronous bus.

4,639,862

COMPUTER SYSTEM

Hideo Wada, and Humio Goto, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,136
Claims priority, application Japan, Mar. 14, 1983, 58-40676
Int. Cl.[4] G06F 13/00
U.S. Cl. 364—200 5 Claims



1. A computer system comprising

(a) a central processing unit,

(b) a main storage,

(c) a storage control unit for controlling read-out from and writing into said main storage in response to an instruction issued from said central processing unit, and

(d) an extended storage connected to said central processing unit and said storage control unit, wherein

(e) said extended storage includes an address space which is independent of the address space of said main storage,

(f) said central processing unit includes an instruction control for providing said extended storage with an instruction of transferring data between said main storage and said extended storage, said instruction having an instruction code and an operand address consisting of a main storage address and an extended storage address,

(g) said extended storage includes

(i) means for holding the instruction code given by the instruction, the main storage address and the extended storage address, and

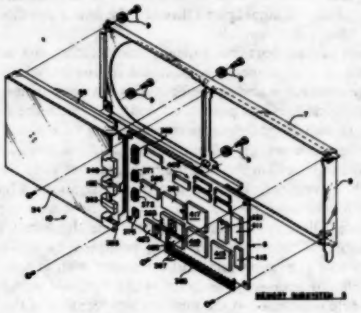
(ii) control means for controlling said extended storage in response to the instruction code received from said means for holding and transferring the main storage address held in said means for holding together with data read out from said extended storage to said storage control unit as a write request into said main storage when said instruction code indicates a read instruction; and for transferring the main storage address held in said means for holding to said storage control unit as a read request from said main storage, receiving data read out from said main storage through said storage control unit and writing said data to said extended storage at said extended storage address held in said means for holding when the instruction code indicates a write instruction.

4,639,863

MODULAR UNITARY DISK FILE SUBSYSTEM

Joel N. Harrison, Monte Sereno; William G. Moon, Sunnyvale, and Randolph H. Graham, Fremont, all of Calif., assignors to Plus Development Corporation, Milpitas, Calif.

Filed Jun. 4, 1985, Ser. No. 741,175
Int. Cl.[4] G06F 1/00; G11B 5/012
U.S. Cl. 364—200 20 Claims



13. A rotating disk memory accessory subsystem module for attachment and use entirely within a housing of a host computer at one of a plurality of accessory plug-in location originally provided for a single, substantially flat electronics printed circuit accessory card, the slot location having predetermined actual length and height dimension constraints and a nominal width dimension constraint for a printed circuit accessory card, said width dimension constraint being defined by the distance between adjacent accessory plug-in slot locations, and said length and height dimension constraints being limited by the internal dimensions of said housing, and each of the slot locations further having at least one multiple signal path receptacle aligned and extending longitudinally along a lower attachment surface providing electrical connection to data, address and control buses of the host computer, said subsystem module including:

support frame means for supporting, aligning and providing electrical interconnection of:

a rotating disk assembly including a radially positionable head transducer for flying in close proximity to a data storage surface of at least one rotating data storage disk upon an air bearing created by rotation of said disk, and wherein the data storage surface lies in a plane which is substantially parallel when the subsystem module is installed at the said one slot location to a plane defined by the length and height dimension constraints of the said one location and which plane passes through a longitudinal axis of the said at least one multiple signal path receptacle, and

printed circuit board means for carrying electronics circuitry including:

at least one multiple signal path edge connector aligned and extending along an edge of said printed circuit board means for mating with said at least one multiple signal path receptacle thereby providing direct plug-in attachment, connection and use of said subsystem module with the host computer without cabling at said one slot location, and

said electronics circuitry including:

data transducer position control means for controlling the radial position of the head transducer in relation to user data block locations on the data storage surface,

disk user data controller means for controlling the formatting, storage and retrieval of user data blocks to and from the storage surface via the head transducer, and

interface means connected to said at least one multiple signal path edge connector, said data transducer position control means and said disk user data controller means for obtaining control signals and data blocks from the host computer for storage of said data blocks on the data surface, and for supplying control signals and retrieving data blocks from the data surface and sending said supplied control signals and retrieved data blocks to the host computer via electrical signal paths through the said connector and the said receptacle,

wherein said support frame means, said rotating disk assembly, and said printed circuit board means including said edge connector and said electronics circuitry of the subsystem module are positioned entirely within the actual length and height dimension constraints of the said one slot location entirely within said housing, location, and lie sufficiently within the width dimension constraint thereof without vertical extension and overhang above adjacent slot locations so that slot locations of the host computer situated directly adjacent to the said one slot location are capable of receiving and being occupied by additional structure providing said host computer with at least one additional accessory function when the said subsystem module is installed at the said one slot location of the host computer.

4,639,864

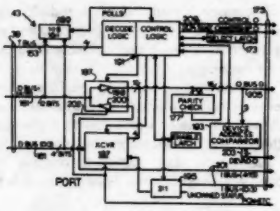
POWER INTERLOCK SYSTEM AND METHOD FOR USE WITH MULTIPROCESSOR SYSTEMS

James A. Katzman, San Jose; Joel F. Bartlett, Palo Alto; Richard M. Bixler, Sunnyvale; William H. Davidow, Atherton; John A. Despotakis, Pleasanton; Peter J. Graziano; Michael D. Green, both of Los Altos; David A. Greig; Steven J. Hayashi, both of Cupertino; David R. Mackie, Ben Lomond; Dennis L. McEvoy, Scotts Valley; James G. Treybig, and Steven W. Wierenga, both of Sunnyvale, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Division of Ser. No. 721,043, Sep. 7, 1976. This application May 6, 1980, Ser. No. 147,135

Int. Cl.[4] G06F *15/16, 13/00, 11/00*

U.S. Cl. 364—200 **5 Claims**



1. A power interlock system for preventing corruption of data on a bus by isolating from the bus logic modules which are usually connected thereto comprising

a plurality of logic modules including interface logic,

a bus connected to the logic modules for communicating data therebetween,

power supply means for supplying power to the logic modules,

voltage monitor means for detecting whether the voltage supplied by the power supply is within a safe power-on range, a safe power-off range, and an unsafe intermediate range,

the interface logic being responsive to the voltage monitor means for operatively isolating a logic module from the bus to prevent corruption of data on the bus when the voltage supplied to that logic module is in the power-off range or the intermediate range by causing the logic module is present a high impedance to the bus.

4,639,865

COMPUTER SYSTEM HAVING CONVERSION OF OPERATION CODES

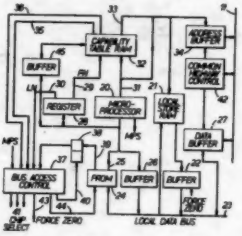
Michael W. Martin, Letchworth, England, assignor to International Computers Limited, London, England

Filed Mar. 19, 1984, Ser. No. 590,962

Claims priority, application United Kingdom, Mar. 24, 1983, 8308149

Int. Cl.[4] G06F *5/00, 9/30*

U.S. Cl. 364—200 **2 Claims**



1. A computer system comprising:

(a) a store for holding instructions, each of said instructions includes an op-code,

(b) an op-code conversion memory having a plurality of locations, each of said locations contains an op-code value and a control signal.

(c) means for fetching instructions from the store and for utilizing the op-code of each instruction to address the op-code conversion memory to thereby read out an op-code value from one of the locations of the op-code conversion memory, and

(d) a processing unit connected to said op-code conversion memory, for receiving and executing each op-code value read out of the op-code conversion memory,

(e) the op-code values held in a majority of the locations of the op-code conversion memory being equal to the respective op-codes by which they are addressed, those op-codes therefore being passed to the processing unit for execution without modification,

(f) the op-code values held in a minority of the locations of the op-code conversion memory being different from the respective op-codes by which they are addressed, those op-codes therefore being converted into different op-code values before being passed to the processing unit for execution,

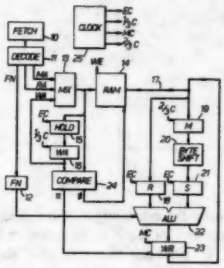
(g) the system also including priviledge level indication means having a first state indicating a privileged level of operation and a second state indicating a non-privileged level of operation, the privilege level indication means being connected to receive said control signal from the op-code conversion memory and to provide an output signal thereto; and

(h) means for setting the privilege level indication means to said first state whenever said control signal has a first value, and to said second state whenever said control signal has a second value.

4,639,866
PIPELINED DATA PROCESSING APPARATUS

Johnson Loo, Newcastle-Under-Lyme, Great Britain, assignor to International Computers Limited, London, England

Filed Jan. 11, 1985, Ser. No. 690,727
Claims priority, application United Kingdom, Jan. 24, 1984, 8401807
Int. Cl.[4] G06F 9/38
U.S. Cl. 364—200 7 Claims



1. Pipelined data processing apparatus for obeying a sequence of instructions, comprising:

(a) a memory,

(b) clock means for producing first clock signal defining a clock beat and at least one further clock signal which divides each clock beat into a write sub-beat and at least one read sub-beat,

(c) means responsive to the first clock signal for advancing each instruction through a read phase, an execute phase, and a write phase during successive clock beats,

(d) execution means connected to the memory and operative during each clock beat to perform a function specified by the instruction currently in its execute phase, thereby producing a result for the instruction,

(e) write means operative during the write sub-beat of each clock beat to write to the memory the result of the instruction currently in its write phase,

(f) read means operative during the read sub-beat of each clock beat to read an operand from the memory for the instruction currently in its read phase,

(g) detection means connected to said write means and to said read means for detecting a read/write clash in which the instruction currently in its read phase requires to read from the memory an operand which is about to be written by the instruction currently in its execute phase, and

(h) means connected to said execution means and to said detection means and operative upon detection of said read/write clash, for making the result of the instruction currently in its execute phase directly available as an operand for the instruction currently in its read phase.

4,639,867
DIGITAL FLUOROSCOPY APPARATUS

Motomu Suzuki, Ootawara, and Hiroshi Asahina, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 20, 1984, Ser. No. 652,656
Claims priority, application Japan, Sep. 21, 1983, 58-173117
Int. Cl.[4] G06F 15/42; G06G 7/60
U.S. Cl. 364—414 8 Claims

1. A digital fluoroscopy apparatus wherein a plurality of X-ray images of an object under examination are sequentially produced and are then converted into a plurality of first analogue image signals comprising:

means for A/D-converting one of the first analogue image signals into first digital image data;

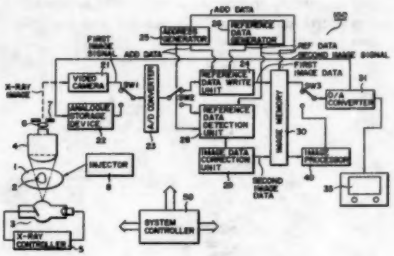
means for generating reference data in a digital form having contrast level information with respect to the X-ray images;

means for generating address data in a digital form;

means for writing, based upon the address data, the reference data into a given data position of the first image data where no medical information is contained;

means for digitally storing the first image data into which the reference data has been written;

means for D/A-converting the first image data derived from the digital storage means into a second analogue image signal having D/A-converted reference data;



analogue storage means for storing the second analogue image signal having the D/A-converted reference data;

means for detecting reference data of second image data derived from the analogue storage means, which has been A/D-converted by the A/D converter means so as to obtain level variations of the A/D-converted reference data written into the second image data from the reference data generated by the reference data generation means; and

means for correcting contrast levels of the second image data detected by the reference data detection means based upon the detected level variations.

4,639,868
CONTROL METHOD FOR DRILLING APPARATUS WHICH MAKES USE OF A FINAL DRILLING PATTERN TRANSFORMED FROM PRIMARY AND SECONDARY PATTERNS

Kazumoto Tanaka, Hiroshima; Tohru Mashimo; Osamu Sato, both of Higashihiroshima, and Toyohiko Kobayashi, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

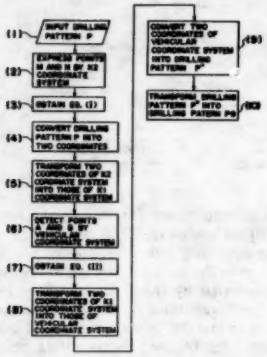
Filed Mar. 19, 1985, Ser. No. 713,493
Claims priority, application Japan, Mar. 24, 1984, 59-56797
Int. Cl.[4] G06F 15/20; E21B 7/00
U.S. Cl. 364—420 9 Claims

1. A drilling method of automatically drilling a facing of a tunnel to be excavated, in which a drilling pattern expressed in a rectangular coordinate system defined with respect to said facing is transformed into a final drilling pattern expressed in a final coordinate system defined with respect to a drilling vehicle such that a boom mounted on said drilling vehicle and mounted with a drilling apparatus is positioned, through feedback control thereof, at a predetermined position of said facing on the basis of said final drilling pattern, said drilling method, when an imaginary facing for excavating a curved tunnel is so employed as to be nonparallel to an existing facing and a primary drilling pattern expressed in a primary coordinate system defined with respect to said imaginary facing has been given so as to be transformed into a secondary drilling pattern expressed rn a secondary coordinate system defined with respect to said existing facing such that said secondary drilling pattern is further transformed into said final drilling pattern, comprising the pretreatment steps of:

(a) expressing first and second coordinates of first and second points of said secondary coordinate system by using

another first and second coordinates of said primary coordinate system, respectively such that a first equation for transformation between said primary and secondary coordinate systems is obtained on the basis of relations between said first coordinates and said another first coordinates and between said second coordinates and said another second coordinates;

(b) converting said primary drilling pattern into third and fourth coordinates of third and fourth points of said primary coordinate system such that said third and fourth coordinates are, respectively, transformed, by using said first equation, into another third and fourth coordinates of said secondary coordinate system, with said another third and fourth coordinates representing said secondary drilling pattern;


(1)
INPUT DRILLING PATTERN P
(2)
EXPRESS POINTS M AND N BY X2 COORDINATE SYSTEM
(3)
OBTAIN EQ. (1)
(4)
CONVERT DRILLING PATTERN P INTO TWO COORDINATES
(5)
TRANSFORM TWO COORDINATES OF X2 COORDINATE SYSTEM INTO THOSE OF X1 COORDINATE SYSTEM
(6)
DETECT POINTS A AND B BY VEHICULAR COORDINATE SYSTEM
(7)
OBTAIN EQ. (2)
(8)
TRANSFORM TWO COORDINATES OF X1 COORDINATE SYSTEM INTO THOSE OF VEHICULAR COORDINATE SYSTEM
(9)
CONVERT TWO COORDINATES OF VEHICULAR COORDINATE SYSTEM INTO DRILLING PATTERN P'
(10)
TRANSFORM DRILLING PATTERN P' INTO DRILLING PATTERN P0

(c) detecting fifth and sixth coordinates of a reference point and a fixed point of said secondary coordinate system, in terms of another fifth and sixth coordinates of said final coordinate system, respectively such that a second equation for transformation between said secondary and final coordinate systems is obtained on the basis of relations between said fifth coordinates and said another fifth coordinates and between said sixth coordinates and said another sixth coordinates, with said fixed point being determined on the basis of said reference point; and

(d) transforming said another third and fourth coordinates of said secondary coordinate system into further third and fourth coordinates of said final coordinate system, respectively by using said second equation such that said further third and fourth coordinates of said final coordinate system are converted into said final drilling pattern of said final coordinate system.

4,639,869

METHOD OF PROVIDING VARIABLE REDUCTION AXLE

Eric L. Storm, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio

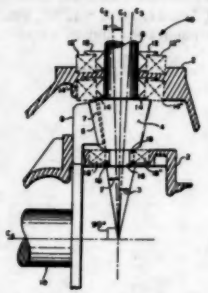
Filed Sep. 20, 1984, Ser. No. 652,247
Int. Cl.[4] B60K 17/16
U.S. Cl. 364—424.1 **2 Claims**

1. In a method of providing a motor vehicle axle differential having a pinion gear and a ring gear having a predetermined number of teeth mounted upon respective shafts with variable gear reduction ratios therebetween by adjusting the angular relationship between the ring gear shaft and the pinion gear shaft according to a range of pinion gears having a varying number of teeth, said method including the steps of;

(a) determining the number of teeth desired for the ring gear;

(b) determining the lowest and highest number of teeth desired for the pinion gear range selected;

(c) determining the median number of pinion gear teeth between the highest and lowest number of teeth determined in step (b);



(d) determining the pitch angle of the pinion gear having the median number of teeth determined in step (c) for a shaft angle of 90° between the ring gear shaft and the pinion gear shaft from the equation:

$$A = \tan^{-1}\frac{n}{N}$$

where:
A=pitch angle of pinion gear in degrees
n=median number of teeth of pinion gear
N=number of ring gear teeth determined in step (a);

(e) determining the pitch angle of the ring gear from the equation:

$$y = 90° - A$$

where:
y=pitch angle of ring gear in degrees
90°=angle between the pinion and ring gear shafts for median pinion gear having median number of teeth;

(f) determining the angle between the pinion gear and ring gear shafts for each pinion gear selected from the highest to the lowest number of teeth determined in step (b) from the equation:

$$x = y - z$$

where:
x=angle between the pinion and ring gear shafts
y=ring gear pitch angle in degrees determined in step (e)

z = pinion gear pitch angle whose tangent is

$$\frac{\sin x}{\frac{N}{n} + \cos y}$$

(for shaft angles less than 90°)

or

z = pinion gear pitch angle whose tangent is

$$\frac{\sin (180° - x)}{\frac{N}{n} - \cos (180° - x)}$$

(for shaft angles greater than 90°)

where:
N=number of ring gear teeth determined in step (a) above
n=particular pinion gear teeth determined in step (b) above and;

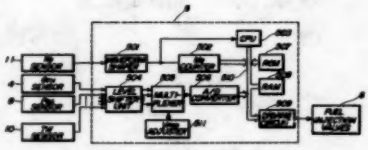
(g) mounting the pinion gear shaft at the angular relationship to the mounted ring gear shaft determined in step (f).

4,639,870

FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES, WITH ADAPTABILITY TO VARIOUS ENGINES AND CONTROLS THEREFOR HAVING DIFFERENT OPERATING CHARACTERISTICS

Yutaka Otobe, Shiki; Takeo Kiuchi, Asaka, and Kikuo Tomozawa, Minato, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Oki Denki Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,788
Claims priority, application Japan, Jun. 15, 1983, 58-107550
Int. Cl.[4] F02D 5/02
U.S. Cl. 364—431.05 3 Claims



1. A fuel supply control method for an internal combustion engine, said method being adapted to determine a quantity of fuel for supply to said engine by multiplying a basic value of said quantity of fuel determined as a function of at least one operating parameter of said engine, by correction coefficients dependent upon operating conditions of said engine, and adding to said basic value correction variables dependent upon operating conditions of said engine, and to supply the determined quantity of fuel to said engine, wherein a single voltage creating means is adjusted to set an output voltage therefrom to a desired value, and a value of a predetermined one of said correction coefficients and a value of a predetermined one of said correction variables are determined which correspond to said set desired value of output voltage of said single voltage creating means, the method being characterized by comprising the steps of:

(1) adjusting a single voltage creating means to set an output voltage therefrom to a desired value, a predetermined one of said correction coefficients having a value thereof set as a function of said output voltage from said voltage creating means, and a predetermined one of said correction variables having a value thereof set as a function of said output voltage from said voltage creating means, wherein said predetermined one correction coefficient and said predetermined one correction variable are in a predetermined relationship with respect to output voltage from said voltage creating means;

(2) determining a value of said predetermined one correction coefficient and a value of said predetermined one correction variable at the same time, which corresponds to said set desired value of output of said voltage creating means; and

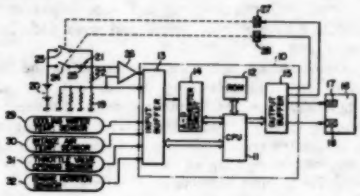
(3) multiplying said basic value of said quantity of fuel by the determined value of said predetermined one correction coefficient together with the correction coefficients other than said predetermined one of said correction coefficients, and adding to said basic value of said quantity of fuel the determined value of said predetermined one correction variable together with the correction variables other than said predetermined one of said correction variables, to determine said quantity of fuel.

4,639,871

GLOW PLUG HEATING CONTROL APPARATUS FOR A DIESEL ENGINE

Tsuyasu Sakai, Toyohashi; Hideaki Namba, Oobu, and Masahiro Ohba, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 2, 1984, Ser. No. 576,479
Claims priority, application Japan, Feb. 3, 1983, 58-16526
Int. Cl.[4] F02P 19/02
U.S. Cl. 364—431.10 9 Claims



4. A glow plug heating control apparatus for a diesel engine which has at least one glow plug energized by an electric current before and after a starting operation of said diesel engine for heating the same, said control apparatus comprising:

means for detecting a resumption of fuel supply to said diesel engine after a cut-off of fuel supply to said diesel engine during a deceleration operation; and

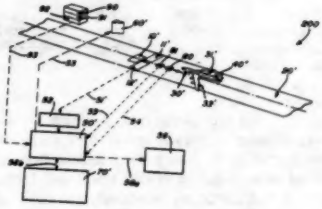
means for energizing said glow plug in response to an output of said fuel supply resumption detecting means.

4,639,872

METHOD AND APPARATUS FOR DETERMINING WEIGHT AND CENTER OF GRAVITY OF A VEHICLE

Charles J. McHale, Pointe Claire; Joseph Marrone, St. Leonard, and David Watson, Hudson, all of Canada, assignors to Aldis Consultants Inc., Montreal, Canada

Filed Feb. 10, 1984, Ser. No. 578,874
Int. Cl.[4] G01M 1/12
U.S. Cl. 364—463 36 Claims



1. An apparatus for use in determining the respective weight and center of gravity of different types of aircraft rapidly prior to their successively taking off, each aircraft including at least a pair of laterally spaced main undercarriage wheels and a tail or nose wheel longitudinally spaced from said main under-carriage wheels with the lateral spacing between the main undercarriage wheels as well as the longitudinal spacing between the nose or tail wheels and the main undercarriage wheels varying substantially from one type of aircraft to another, said apparatus comprising in combination:

(a) a plurality of load measuring devices secured to a roadway in spaced relation one to another and integrally forming part of said roadway, ones of said devices each comprising an elongated aircraft wheel supporting platform extending transversely of said roadway for respectively receiving and supporting the respective varyingly spaced

main undercarriage wheels of said different types of aircraft as said aircraft are moved along a common path of travel upon said roadway, said path extending in a direction generally normal to the length of each platform, a further one of said devices comprising an aircraft wheel supporting platform positioned in said path of travel for receiving and supporting the respective nose or tail wheel of said different types of aircraft as said aircraft are moved along said common path of travel;

(b) aircraft weight readout means linked to said load measuring devices for displaying load data measured thereby upon said platforms receiving and supporting thereon said respective aircraft nose or tail and main undercarriage wheels; and

(c) computer means operatively connected in the link between said load measuring devices and said aircraft weight readout means, for use in computing the respective center of gravity of said different types of aircraft following successive arrival of the wheels thereof on said platforms, said computing of said centerof gravity of each respective aircraft utilizing data entered into said computer means, said data comprising nose or tail wheel to main undercarriage wheel spacing and the loads measured by said load measuring devices, whereby following said computing, center of gravity data for the aircraft may be is displayed on said readout means.

4,639,573

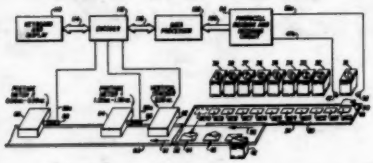
INSERTION MACHINE WITH POSTAGE CATEGORIZATION AND SELECTIVE MERCHANDISING

Brad A. Baggarly, Upland, Calif., and Christopher K. Scullion, Bethlehem, Pa., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 576,839, Feb. 3, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,389

Int. Cl.[4] B65H *39/075;* **B65B** *35/50;* **G06F** *15/20*

U.S. Cl. 364—466 **20 Claims**



1. An insertion machine of the type in which a plurality of feed stations feed items onto an insertion track, said plurality of feed stations including a control feed station from which a master control item is fed onto said track and further feed stations from which items are selectively fed in accordance with indicia on said master control item onto said track for inclusion with a group including said master control item, wherein the improvement comprises:

means for reading said indicia;

means for designating whether at least one of said feed stations is a required feed station from which items must be fed if said indicia so indicates or an optional feed station from which items may conditionally be fed;

means for determining from said indicia on said master control item the particular further feed stations from which items must be fed onto said insertion track for inclusion with said group including said master control item;

data processing means including memory means and arithmetic logic means;

means including said data processing arithmetic logic means for using values indicative of the per item weight of items held in said control feed station and said required feed stations from which it is required that items be fed to obtain a calculated total weight with respect to said group of items;

means for using said calculated total weight to determine a postage category for said group of items; and,

means for determining whether optional items from one or more respective optional feed stations can be fed from said optional feed stations and associated with said group of items without changing the postage category determined on the basis of the calculated total weight of said group of items.

4,639,874

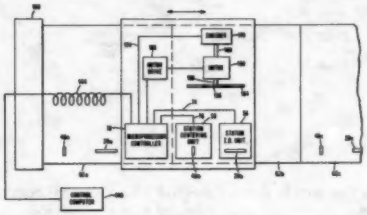
SYSTEM FOR MONITORING AND CONTROLLING POSITION OF HOISTS

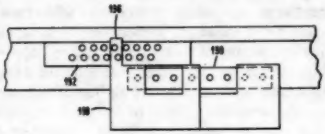
Stylianos Pezaris, Winchester, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Apr. 18, 1984, Ser. No. 601,766

Int. Cl.[4] G05B *5/01*

U.S. Cl. 364—478 **6 Claims**





1. Apparatus for monitoring and controlling the position of a hoist operable to move articles to and from selected work stations located along a line of tanks comprising:

a frame for supporting the hoist above said tanks;

a sensing unit mounted on the hoist, said sensing unit including an array of radiation emitters spaced along the direction of movement of said hoist and an array of radiation detectors facing said radiation emitters and defining an elongated gap therebetween;

a mounting strip attached to said frame and extending along said line of tanks;

a stationary plate attached to said mounting strip at each of said work stations, each of said places having elements for blocking radiation from selected emitters of said sensing unit when said hoist is moved to, or positoned at, a work station, to indicate that the hoist is positioned at a work station and to indicate the identify of said station;

said mounting strip having regularly spaced perforations for facilitating relocation of one or more of said stationary plates;

drive means for moving said hoist among, and stopping said hoist at, said work stations without physically contacting any of said plates;

an encoder attached to said drive means, said encoder operable to provide signals indicating the distance and direction of movement of said hoist from a reference point; and

a computer connected to said sensing unit, to said drive means, and to said encoder, said computer operable: (a) from signals produced by said sensing unit, to determine

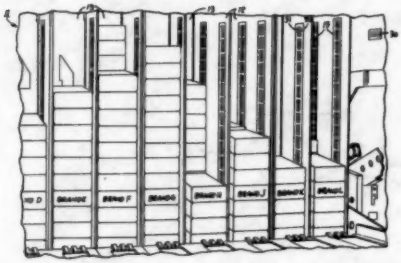
the position of the hoist at a work station and the identity of said station, (b) from signals from said encoder, to determine the position of the hoist between work stations and to verify on-station positioning of said hoist, and (c) by use of the position information of (a) and (b) above, to direct said drive means to rapidly move the hoist to, and stop the hoist at, a selected work station.

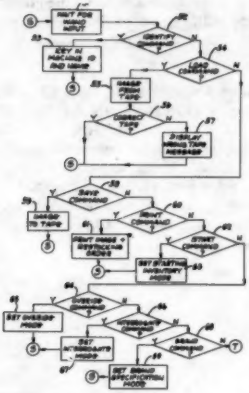
4,639,875

QUANTITY CHECKING SYSTEM AND METHOD

Joseph N. Abraham, 4290 Silsby Rd., University Heights, Ohio 44118, and Donald S. Scipione, 2427 Woodmere Dr., Cleveland Heights, Ohio 44106

Filed May 17, 1984, Ser. No. 611,509
Int. Cl.[4] G06F *15/20, 15/226;* G06G *7/48*
U.S. Cl. 364—479 **18 Claims**





1. A quantity checking system for a plurality of storage racks for storage of articles in a vending machine with the articles adapted to be dispensed from the racks, said articles adapted to be stored along the length of each rack in numerical sequence, said system comprising in combination:

means for dispensing articles from the racks;

passive indicia mounted adjacent each of said plurality of racks and adapted to identify a plurality of different brands of articles;

each of said indicia being subdivided along the length of the rack into passive individual indicia, each one corresponding to the numerical sequence of the respective adjacent article stored in the rack;

interrogation means unconnected to, yet cooperable with, said indicia for interrogating and determining data from said indicia as to a particular rack and the sequential number of the last article near one end of the particular rack at that instant;

memory means having an input from said interrogation means to store data from each said indicia from each interrogation of the plurality of storage racks and to store data from at least one prior interrogation of the plurality of storage racks; and

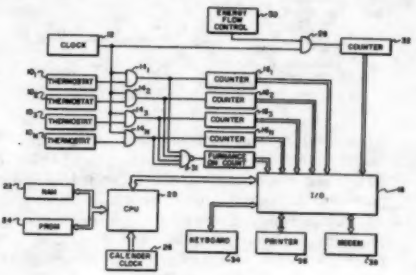
a computer connectable to said memory means to determine which brands of articles are being dispensed more frequently.

4,639,876

MULTI-UNIT ENERGY USE MONITOR

Robert G. Deeds, 214 N. Harvard, Villa Park, Ill. 60181

Filed Oct. 22, 1984, Ser. No. 663,447
Int. Cl.[4] G01R *19/00;* G01K *17/06*
U.S. Cl. 364—483 **6 Claims**



1. A system for monitoring energy use by each of a plurality of users of a common heating/cooling system wherein each said user is provided with an individual on/off state thermostat coupled to said system such that when any thermostat is in the on state heating/cooling is provided to the respective user, said energy monitoring system comprising

means for generating clock pulses at a preselected frequency;

a plurality of first gating means, one associated with each of said individual thermostats, having a first input coupled to its respective thermostat, having a second input coupled to said clock pulse generating means, and an output whereby clock pulses are passed to the output of said plurality of first gating means at any time the associated thermostat is on;

a plurality of first counting means, one associated with each of said first gating means, having an input coupled to the output of and operative to count the clock pulses passed by its respective first gating means;

means for periodically scanning each of said plurality of first counting means to determine the number of pulses counted thereby since the next previous scan thereof; and

means coupled to said scanning means for accumulating the number of pulses counted by each individual counting means during a preselected interval of time and generating an output signal indicating the total amount of time that each said thermostat was on during said interval of time.

4,639,877

PHRASE-PROGRAMMABLE DIGITAL SPEECH SYSTEM

William J. Raymond, Barrington; Robert L. Morgan, Rolling Meadows, and Ricky L. Miller, Elgin, all of Ill., assignors to Jostens Learning Systems, Inc., Minneapolis, Minn.

Filed Feb. 24, 1983, Ser. No. 469,482
Int. Cl.[4] G10L *5/00*
U.S. Cl. 364—513.5 **19 Claims**

1. A phrase speaking computer system having a programma-

ble digital computer and a speech processor, the speech processor comprising:

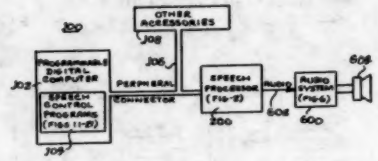
a voice synthesizer;

a read/write speech data segment memory;

a read/write command memory;

control processor means including processor control programs and logic connecting to said memories and to said voice synthesizer, and arranged to scan said command memory and to respond to command data entries stored therein by transferring corresponding speech data segments from said speech data segment memory to said voice synthesizer;

data conveyance means, connecting said computer to said command memory and said speech data segment memory,



for transferring said command data entries supplied by said computer into said command memory and for transferring said speech data segments supplied by said computer into said speech data segment memory; and

an enable signal line connecting said computer to said speech processor and arranged to initiate the operation of said processor control programs and logic when said enable signal line is enabled by said computer;

said programmable computer including speech control programs controlling the operation of said computer including data conveyance command sequences that cause said computer to supply command data entries to said data conveyance means and speech processor enabling command sequences that cause said computer to energize said enable signal line.

4,639,878

METHOD AND SYSTEM FOR AUTOMATICALLY DETERMINING THE POSITION AND ATTITUDE OF AN OBJECT

Chia P. Day, Troy; Kenneth W. Krause, Rochester; Louis L. Whitcomb, Troy, all of Mich., and Berthold K. P. Horn, Concord, Mass., assignors to GMF Robotics Corporation, Troy, Mich.

Filed Jun. 4, 1985, Ser. No. 741,123

Int. Cl.[4] G06E *15/46*; B25J *9/00*

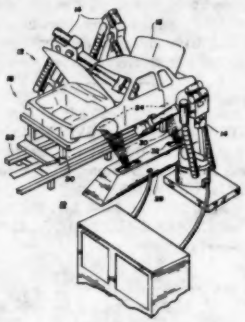
U.S. Cl. 364—513 **18 Claims**

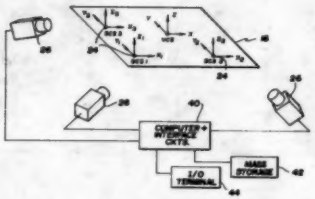
1. Method for automatically determining the position and attitude of a three-dimensional body in space having at least three spaced apart target points at a vision station having a fixed coordinate system, said method comprising the steps of:

generating calibration data defining a nominal position of the body at the vision station;

generating substantially simultaneously a single plane of image data for each of said target points, each plane of image data containing its respective target point and each plane of image data being non-overlapping with respect to each of the other planes of image data;

determining the locations of the target points within their respective image planes to obtain positional data; and





processing the calibration data and the positional data together to provide data defining the position and attitude of the body with respect to the fixed coordinate system.

4,639,879

METHOD AND DEVICE FOR LIGHT EMITTING INTENSITY CONTROL IN A GRAPHIC DISPLAY DEVICE

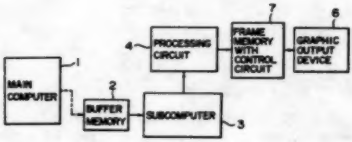
Hiromi Chaya, Shiga, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 15, 1983, Ser. No. 466,503

Claims priority, application Japan, Feb. 19, 1982, 57-25618

Int. Cl.[4] G06F *3/14*

U.S. Cl. 364—518 **27 Claims**



11. A device for light emitting intensity control in a graphic display device which performs brightness operations on every picture element of the graphic display device by utilizing picture element memory means in the graphic display device to which command signals are input from an external source, which allows the graphic display device to generate brightness signals by itself according to time duration without being fed any brightness signals from the external source, comprising:

(a) a computer which inputs a light emitting intensity control start signal, a signal designating the light emitting intensity signal and the kind of computation, and a computational constant signal;

(b) a memory device which stores these signals;

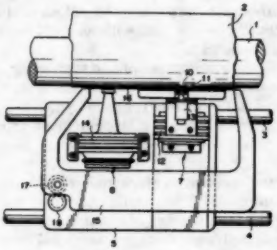
(c) an instruction decoder for decoding these signals;
(d) a computation unit for computing a computational result, according to an arithmetic function, from the light emitting intensity signal and the computational constant; and
(e) a display unit which displays at a light emitting intensity corresponding to the computational result of the computational unit.

4,639,880

RIBBON FEED SYSTEM OF COMBINED PRINTER

Miki Yasuhiro, Nagoya, Japan, assignor to Brother Industries, Ltd., Nagoya, Japan

Filed Aug. 7, 1985, Ser. No. 763,467
Claims priority, application Japan, Aug. 21, 1984, 59-174721
Int. Cl.[4] B41J 3/58
U.S. Cl. 364—519 2 Claims



1. In a combined printer comprising a first printing section for printing characters by using types, a second printing section for printing character patterns formed by a matrix of dots and a print ribbon for performing printing as the first printing section and second printing section are moved in the direction in which printing is to be performed in one line, a ribbon feed system comprising:

ribbon drive means for moving the print ribbon;

a first control unit for controlling the ribbon drive means in such a manner that the print ribbon is fed intermittently a predetermined distance each time one character is printed when the first printing section is rendered operative;

a second control unit for controlling the ribbon drive means in such a manner that the print ribbon is continuously fed when the second printing section is rendered operative; and

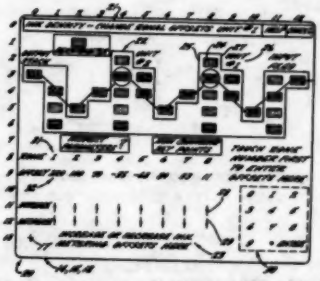
a control means including a means for deciding whether print data inputted from outside are data to be printed by using the first printing section or data to be printed by using the second printing section, a first selecting means for selecting said first printing section when said deciding means decides that the print data inputted from outside are data to be printed by using the first printing section, and selecting said second printing section when said deciding menas decides that the print data inputted from outside are data to be printed by using the second printing section, and a second selecting means for selecting said first control unit in order to carry out intermittent feeding of said print ribbon when said first selecting step selects the first printing section and selecting said second control unit in order to carry out continuous feeding of said print ribbon when said first selecting step selects the second printing section.

4,639,881

DATA INPUT UNIT AND METHOD FOR PRINTING MACHINES

Oded Zingher, Muhlweg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen AG., Fed. Rep. of Germany

Filed Jun. 1, 1983, Ser. No. 499,860
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1982, 3220622
Int. Cl.[4] G06F 15/626; G09G 3/02
U.S. Cl. 364—521 50 Claims



1. A control terminal for the remote computer control of a printing machine, the control terminal having a video display for computer-generated output and a transparent pressure-sensitive sensor having a plurality of pressure-sensitive points overlaid on the video display for input from a machine operator to a remote control computer, wherein the improvement comprises

a graphics template having at least part of a machine diagram providing a pictorial representation of the printing machine, said template also being overlaid on the video display, the video display having means for selectively generating visually perceptible symbols aligned with certain respective machine status areas on the part of the machine diagram on the graphics template, said machine status areas pictorially representing specific respective components of the printing machine, and the pressure-sensitive sensor having pressure-sensitive points aligned with the machine status areas; and

means for initiating and conducting a respective interactive input-output procedure between the control terminal and the machine operator corresponding to a selected machine status area but using a common portion of the video display and pressure-sensitive sensor separate from the machine diagram after the operator presses a pressure-sensitive point aligned with the selected machine status area.

4,639,882

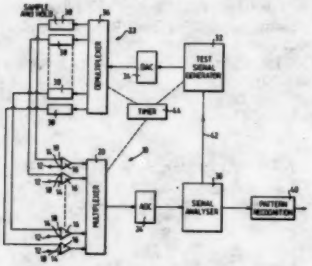
MONITORING SYSTEM

Albert B. Keats, Dorchester, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jun. 18, 1984, Ser. No. 621,720
Claims priority, application United Kingdom, Jun. 24, 1983, 8317224
Int. Cl.[4] H04J 3/14; G01K 7/02
U.S. Cl. 364—550 13 Claims

1. A system for monitoring a plurality of data signals from a plant or apparatus, each data signal representing a parameter of the plant or apparatus, the system comprising, means for periodically examining the data signals and for providing output signals representing whether each data signal represents an acceptable or an unacceptable state of the respective parameter, and means for supplying test signals to be superimposed on selected said data signals before each periodic examination thereof such as to produce corresponding combined signals

equivalent to data signals representing the unacceptable state, the selection of the data signals on which the test signals are superimposed being changed for each periodic examination of



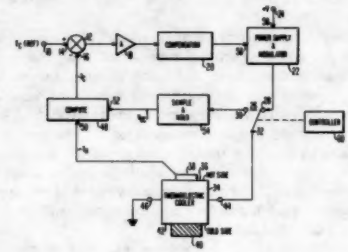
the data signals within a predetermined sequence so that the examining means produces a recognisable pattern of said output signals.

4,639,883

THERMOELECTRIC COOLING SYSTEM AND METHOD

Theodore D. Michaelis, Medford, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 28, 1984, Ser. No. 675,779
Int. Cl.[4] F25B *21/02*; G06F *15/32*
U.S. Cl. 364—557 **22 Claims**



8. A thermoelectric cooling system including:

means for providing electric current;

a thermoelectric cooler having a cold side and a hot side and having terminals for receiving said electric current therethrough, said electric current being applied to said terminals such that said current flows through said thermoelectric cooler in a direction so as to maintain said cold side at a temperature lower than said hot side, said thermoelectric cooler being adapted to be affixed at its cold side to a workpiece;

means for sensing the temperature at said hot side of said thermoelectric cooler;

means for periodically interrupting said electric current supplied to said thermoelectric cooler;

means for detecting the voltage across said terminals during said interruptions, said voltage being induced by the difference in temperature between hot side and said cold side;

means responsive to said sensing means and to said detecting means for computing the temperature of said cold side of said thermoelectric cooler; and

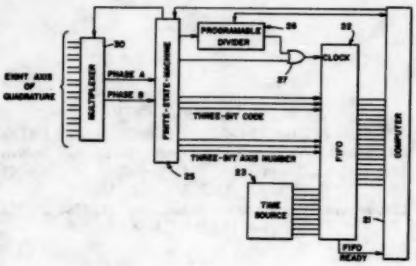
means coupled to said source of electric current and responsive to said computing means for controlling said flow of electric current.

4,639,884

METHOD AND APPARATUS FOR MEASURING VELOCITY AND POSITION IN SERVO SYSTEMS

Paul Sagues, Berkeley, Calif., assignor to Berkeley Process Control, Inc., Berkeley, Calif.

Filed Mar. 5, 1984, Ser. No. 586,250
Int. Cl.[4] G01P *3/42*; G06F *15/20*
U.S. Cl. 364—565 **16 Claims**



1. A method for measuring the velocity of a servo shaft driven cyclically by a motor, without employing a tachmeter, comprising the steps of:

producing from movement of said shaft a pair of overlapping square-wave signals in quadrature with transitions expressible in Gray code for each cycle,

producing from a clock a large number of evenly spaced clock pulses per a selected number of quadrature transitions,

reading the number of clock pulses between two selected quadrature transitions, and

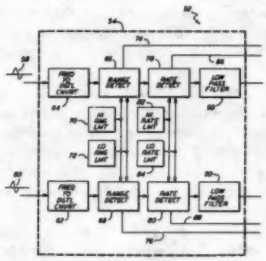
dividing the total number of quadrature transitions between said selected transitions by the total number of clock pulses during the same time.

4,639,885

EMI SUPPRESSION FOR ELECTRONIC ENGINE CONTROL FREQUENCY SIGNAL INPUTS

Wayne R. Spock, Canton, and Richard P. Meisner, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1984, Ser. No. 686,064
Int. Cl.[4] H04B *15/00*
U.S. Cl. 364—574 **4 Claims**



1. Apparatus for use in digital electronic engine controls for selecting the best signal representation of a gas turbine engine parameter from among the sample values of two sensed signals representative of the parameter actual value, and a synthesized signal representative of the parameter nominal value, comprising:

signal comparison means, responsive to the sampled values of each of the two sensed signals, for comparing each sample value to maximum and minimum performance value limits established for the parameter, and for rejecting those sensed signal samples which exceed these limits; and

signal selection means, responsive to the nonrejected sensed signal samples from said signal comparison means

for determining the difference signal magnitude between the sampled actual parameter value and the nominal value of the synthesized signal,

for rejecting each previously nonrejected sensed signal sample having said difference value greater than a selected maximum,

for selecting a nonrejected sensed signal sample as the parameter value in the presence of nonrejected samples, and

for selecting the synthesized signal as the parameter value in the absence of nonrejected sensed signal samples.

4,639,886

ARITHMETIC SYSTEM HAVING PIPELINE STRUCTURE ARITHMETIC MEANS

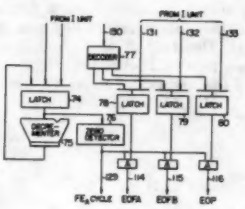
Masahiro Hashimoto, Sagamihara; Tsuyoshi Watanabe, Hadano, and Kenichi Wada, Zama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,047

Claims priority, application Japan, Jun. 29, 1982, 57-112111

Int. Cl.⁴ G06F 7/38

U.S. Cl. 364—736 **20 Claims**



1. An arithmetic system having pipeline arithmetic means for executing arithmetic operations in accordance with instructions provided by instruction means, comprising:

first arithmetic means for executing simultaneously N arithmetic operations by pipelined processing for N instructions, where N is an integer equal to or larger than two; and

first indicating means, connected to receive from said instruction means information as to the number of execution cycles required by said first arithmetic means for execution of the instruction, for indicating with a signal when each of the instructions being executed in said first arithmetic means requires N cycles before completion of the execution of the instruction;

wherein said first arithmetic means includes means connected to said first indicating means for initiating an arithmetic operation for a new instruction in response to the indication signal of said first indicating means.

4,639,887

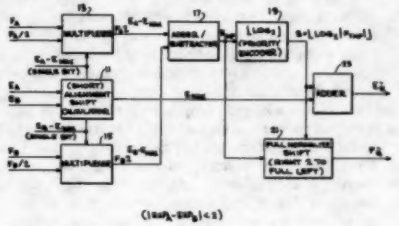
BIFURCATED METHOD AND APPARATUS FOR FLOATING POINT ADDITION WITH DECREASED LATENCY TIME

Paul M. Farmwald, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 24, 1984, Ser. No. 583,531

Int. Cl.⁴ G06F 7/50

U.S. Cl. 364—748 **14 Claims**



1. In a method for performing floating point addition of a pair of floating point binary numbers each expressed as a mantissa and an exponent, comprising the steps of alignment of the mantissas, addition of the aligned mantissas and postnormalization of the mantissa of the sum, the improvement comprising;

comparing the exponents of the two floating point numbers prior to the alignment step;

simultaneously performing two separate calculations along first and second separate parallel paths as follows:

calculating a first sum in the first path as if the difference of the exponents is either 0 or 1, including performing the alignment step by at most a one place right shift of one mantissa;

simultaneously calculating a second sum in the second path as if the difference of the exponents is greater than 1, including performing the postnormalization step by at most a one place shift of the mantissa of the second sum;

selecting between the first sum and the second sum after simultaneously performing the two calculations.

4,639,888

CIRCUIT ARRANGEMENT FOR ACCELERATED CARRY FORMATION IN AN ADDER DEVICE

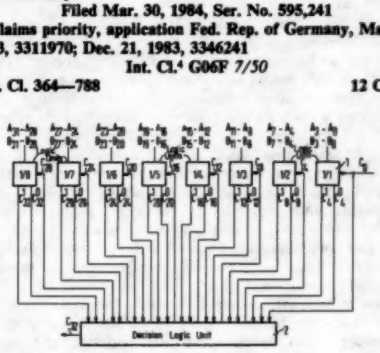
Hans K. Nussbaecher, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,241

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311970; Dec. 21, 1983, 3346241

Int. Cl.⁴ G06F 7/50

U.S. Cl. 364—788 **12 Claims**



1. A circuit arrangement for accelerated carry information in an adder device in response to an input carry for the adder

device, in which a plurality of binary-coded operands are available as input signals in first and second groups which are sub-divided into mutually corresponding bit groups, comprising:

a plurality of parallel operating logic units each including inputs for receiving respective operands of mutually corresponding bit groups;

each of said logic units comprising means for forming a respective carry pair in response to its input operands, and a pair of outputs for said carry pair independently of the two possible values of the input carry of the bit group;

a decision logic unit including a plurality of inputs connected to said carry pair outputs of said plurality of logic units, a control input for receiving the input carry of the adder device and a plurality of outputs each connected to a respective logic unit;

said decision logic unit comprising a plurality of individual selection switches arranged in time stages and operable to select the output carries, beginning with the carry pairs of a predetermined plurality of the lowest big groups, belonging to such bit groups dependent on the input carry of the adder device and, dependent on the most significant actual output carry respectively identified in the preceding time stage, and increasing number of actual high-order output carries being selected in each following time stage until all carry pairs of said logic units have been served; and

said selection switches for the selection of the individual actual output carries being ordered such that for the selection of the individual, actual output carries the selection switches are partly preceded in pairs by selection switches of lower time stages by way of which, respectively dependent on a lower-order carry pair, the respectively appertaining carry is selectable from at least one following higher-order carry pairs so that, in chronological succession, more intermediate carry pairs combining carry pairs are always successively formed simultaneously with the already occurring offering of lower-order output carries.

4,639,889

SYSTEM FOR CONTROLLING COMMUNICATION BETWEEN A MAIN CONTROL ASSEMBLY AND PROGRAMMABLE TERMINAL UNITS

Hiromichi Matsumoto, and Ritsuo Hashimoto, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Company, Kyoto, Japan

Continuation of Ser. No. 550,061, Nov. 9, 1983, abandoned, which is a continuation of Ser. No. 235,951, Feb. 19, 1981, abandoned. This application Sep. 17, 1984, Ser. No. 651,639

Claims priority, application Japan, Feb. 19, 1980, 55-19919; Mar. 12, 1980, 55-32031; Mar. 12, 1980, 55-32032; Mar. 14, 1980, 55-33149

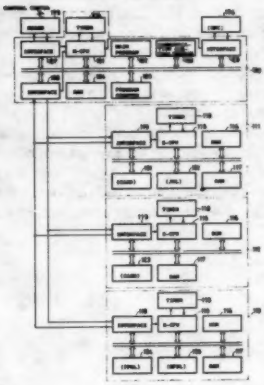
Int. Cl.⁴ G06F *15/16, 11/06*

U.S. Cl. 364—900 **12 Claims**

1. A system for controlling communication between a main control assembly having a central processing unit and a plurality of individually programmable input/output terminal units each having a slave central processing unit and a program to control the operation of the respective input/output terminal unit, each of said input/output terminal units having a different address, and communication means including a set of communication lines connecting said main control assembly to all of said terminal units, and interface means in said main control assembly and in each of said terminal units and connected to said set of communication lines for serially transmitting messages between said main conirol assembly and said terminal units, said system comprising:

means in said main control assembly for controlling said input/output terminal units including memory means having stored therein instructions including instructions for controlling said input/output terminal units in a predetermined sequence, processing means for reading said instructions and editing a message corresponding to an instruction for transmission to a selected one of said input/output terminal units including the address of said selected unit, and means for transmitting said message to said selected input/output terminal unit via said communications means; and

means in said main control assembly for controlling the communication between said main control assembly and



said input/output terminal units to cause said main control assembly, to address a message to a selected input/output terminal unit and, after a response is received from said selected input/output terminal unit indicating completion of the instruction, to cause said main control assembly to read the next instruction.

4,639,890

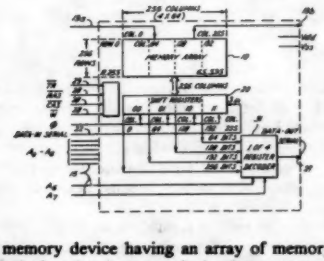
VIDEO DISPLAY SYSTEM USING MEMORY WITH PARALLEL AND SERIAL ACCESS EMPLOYING SELECTABLE CASCADED SERIAL SHIFT REGISTERS

Andrew Heilveil; Jerry R. VanAken; Karl M. Guttag; Donald J. Redwine, all of Houston; Raymond Pinkham, Stafford, and Mark F. Novak, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1983, Ser. No. 567,040

Int. Cl.⁴ G09G *1/02*

U.S. Cl. 364—900 **26 Claims**



1. In a memory device having an array of memory cells, address terminals, a data input terminal, a data output terminal, means responsive to address signals received by said address terminals for addressing a memory cell in said array, means for writing data presented at said data input terminal to an addressed memory cell, and means for reading data contained in an addressed memory cell so that said data is presented at said data output terminal, the improvement comprising:

a register comprised of a plurality of memory cells;

means, coupled to said array and to said register, for trans-

ferring the contents of a predetermined number of memory cells in said array to memory cells in said register;

a serial output terminal;

serial output means, connected to said serial output terminal and connectable to a memory cell in said register, for communicating the contents of said selected memory cell to said serial output terminal;

means for selecting a memory cell in said register to be connected to said serial output means, responsive to an address signal received by said address terminals;

a serial clock terminal for receiving a clock signal;

shifting means, connected to said serial clock terminal, for shifting the contents of another memory cell in said register to said serial output means so that, responsive to a series of said clock signals received by said serial clock terminal, the contents of a series of memory cells in said register are presented at said serial output terminal, beginning with the contents of the memory cell in said register selected by said selecting means;

a transfer control terminal for receiving a transfer control signal; and

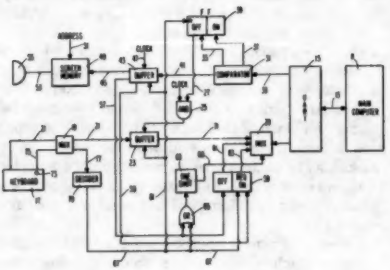
transfer control means, connected to said transfer control terminal and to said transferring means, for enabling and disabling said transferring means responsive to said transfer control signal, so that during such time as said transferring means is disabled, data may be written to and read from any of said memory cells in said array independently from the presentation of data at said serial output terminal.

4,639,891

SIGNALS PATH CONTROL CIRCUITRY FOR A DATA TERMINAL

Thomas C. Porcher, Stow, Mass., and Morgan E. Robinson, Hanover, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 14, 1983, Ser. No. 551,010
Int. Cl.[4] G06F *3/04*
U.S. Cl. 364—900 **9 Claims**



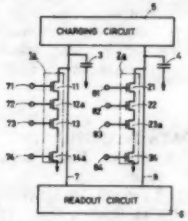
1. In a data terminal system which has a data output means including a data display means an output means memory and a keyboard means and which data terminal system is formed to receive from and send data signals to a main data processor, which main data processor transmits coded "on" and "off" signals to said data terminal system to control whether or not said data terminal system transmits signals to said main data processor, an arrangement to alternatively clear and block transmission of signals between said data terminal system and said main data processor comprising in combination: bidirectional signal conversion means formed to convert parallel signals to serial signals and alternatively to convert serial signals to parallel signals, said bidirectional signal conversion means coupled to receive from and send signals to said main data processor; first signal buffer means formed to have first clearing means which can cause said first signal buffer means to be cleared in response to a clear signal and connected to said output means memory to transmit signals thereto for display on said data display means; first logic circuitry including monitoring signal means connected to said bidirectional signal conversion means and to said first buffer means to receive signals to be passed to said first buffer means and monitor said last mentioned signals to detect said coded "on" and "off" signals should either be present; keyboard circuitry means including a clear communication signal means connected to said keyboard; second signal buffer means formed to have second clearing means which can cause said second signal buffer means to be cleared in response to a clear signal and connected to said keyboard circuitry means to receive signals from said keyboard and store the same for further transmission; second logic circuitry connected to said first logic circuitry, to said second buffer means and to said bidirectional signal conversion means to selectively pass data signals to said main data processor through said bidirectional signal conversion means; third circuitry means connected from said clear communication signal means to said first and second buffer means and to said first logic circuitry whereby, in response to a clear communication signal from said keyboard circuitry means, said third circuitry means transmits a clear signal to said first and second clearing means to clear said first and second buffer means and transmits a reset signal to said first logic circuitry to reset said monitor signal means to an "on" condition in the event said monitor signal means is in an "off" condition.

4,639,892

SEMICONDUCTOR READ-ONLY MEMORY DEVICE

Shigeo Mizugaki, and Tsunenori Umeki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,387
Claims priority, application Japan, Nov. 30, 1982, 57-211601
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—182 **11 Claims**



1. A semiconductor read-only memory device having at least first and second different types of MOS field effect transistor means for storage of different values of data bits, said first and second types of MOS transistor means formed on a substrate and in electrical connection with each other, each transistor means having a gate electrode means on a major surface of said substrate defining a gate area therein,

said first type of MOS transistor means including two-level turn on means for causing said type of MOS field effect transistor to be turned on in response to application of either of a first or second different voltage level to the gate electrode means thereof, said two-level turn on means comprising a structural arrangement including double diffusion deep and shallow drain and sink regions with substantial lateral diffusion expansion regions, said lateral diffusion exapnsion regions providing a reduced effective gate length, said reduced effective gate length being substantially shorter than the width of said gate electrode means thereof for simulating a depletion type MOS transistor independently of channel doping thereof,

said second type of MOS transistor means including on-off means for causing said second type of MOS field effect transistor to be turned on in response to application of said

first voltage level to the gate electrode means thereof and to be turned off in response to application of said second voltage level to the gate electrode means thereof, said on-off means comprising a structural arrangement including a graded drain structure with deep diffusion drain and sink regions and shallow diffusion regions at least adjacent said gate electrode means thereof thereby minimizing reduction of effective gate length and providing a substantially longer effective gate length than the effective gate length of said first type of transistor means.

4,639,893

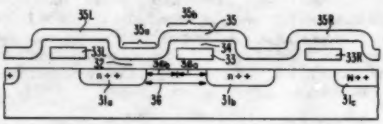
SELF-ALIGNED SPLIT GATE EPROM

Boaz Eitan, Sunnyvale, Calif., assignor to Wafer Scale Integration, Inc., Fremont, Calif.

Filed May 15, 1984, Ser. No. 610,369

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—185 **7 Claims**



1. A self-aligned split gate single transistor memory cell for a programmable read only memory comprising

a semiconductor substrate containing a source region and a drain region separated by a channel region;

a floating gate formed over but insulated from a first portion of the channel region, a first edge of the floating gate being aligned with and used to define one edge of said drain region and a second edge of said floating gate being over said channel region and separated from the closest edge of said source region by a second portion of said channel region; and

a control gate formed over but insulated from said floating gate and formed over but insulated from said second portion of said channel region.

4,639,894

DATA TRANSFERRING METHOD

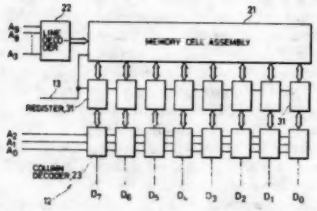
Chiharu Ishii, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,001

Claims priority, application Japan, Feb. 25, 1984, 59-33374

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 **12 Claims**



10. A memory addressed by an address word comprising:

a word-organized memory cell assembly arranged as M rows by N words with P bits per word;

a row decoder coupled to said memory cell assembly and enabled by certain bits of said address word;

P registers of N words, coupled to said memory cell assembly to receive the data from an entire row of said memory selected by said row decoder and to present for input the data in an entire row of said memory selected by said row decoder; and

P column decoders enabled by certain bits of said address word for transferring P-bit data between said P registers and a P-bit data bus.

4,639,895

SEMICONDUCTOR MEMORY DEVICE

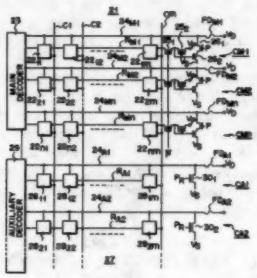
Hiroshi Iwahashi, and Kiyofumi Ochii, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1983, Ser. No. 497,135

Claims priority, application Japan, May 28, 1982, 57-89891

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—200 **5 Claims**



1. An error correction semiconductor memory device coupled to a power source comprising:

a main memory including a plurality of memory cells arranged in a matrix of rows and columns, one of said memory cells which does not operate correctly being an error bit cell;

an auxiliary memory used as a redundance memory including a plurality of auxiliary memory cells arranged in a matrix of rows and columns;

a plurality of main row lines each connected to said main memory cells in a different row of said main memory;

a plurality of auxiliary row lines each connected to said auxiliary memory cells in a different row of said auxiliary memory, each of said auxiliary row lines corresponding to a different row line in said main memory;

a plurality of column lines each commonly connected to said main memory cells and auxiliary memory cells in different corresponding columns of said main and auxiliary memories;

a plurality of power source lines connected to said power source, each of said power source lines being connected to a different one of said main row lines and auxiliary row lines;

an enhancement type MOS transistor connected between said power source and the power source line corresponding to the row line connected to said error bit cell of said main memory; and

means for turning off said enhancement type MOS transistor for disconnecting said corresponding power source line from said power source, said turning off means including a depletion type MOS transistor and a resistance element connected in series between a predetermined potential and a reference potential, one terminal of the source-drain path of said depletion type MOS transistor being connected to said predetermined potential and the other terminal of the source-drain path and the gate of said depletion type MOS transistor being connected to one terminal of said resistance element, the other terminal of said resistance element being connected to said reference potential, and the junction of said other terminal of said source-drain

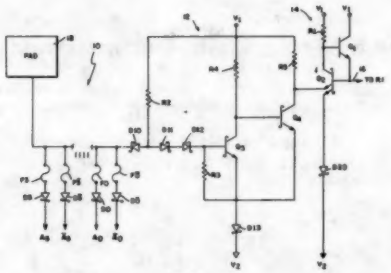
path of said depletion type MOS transistor and said one terminal of said resistance element being connected to the gate of said enhancement type MOS transistor, wherein said corresponding power source line is disconnected from said power source at times when said error bit cell is detected.

4,639,896

REDUNDANT ROW DECODING FOR PROGRAMMABLE DEVICES

Michael J. Brannigan, Palm Bay, Fla., and David L. Rutledge, Beaverton, Oreg., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 30, 1984, Ser. No. 676,846
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—200 **7 Claims**



1. In a memory array having at least one redundant row, programmable decoder for said redundant row, and a row driver connected between said programmable decoder and said redundant row, the improvement comprising:

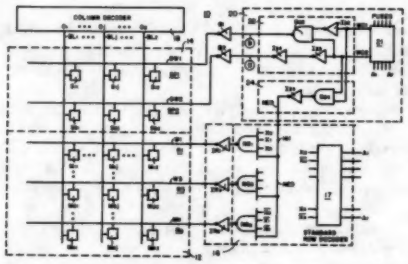
protection means connected between said programmable decoder and said row driver for isolating said decoder from said row driver and for limiting the voltage across said programmable decoder.

4,639,897

PRIORITY ENCODED SPARE ELEMENT DECODER

Ihor T. Wacyk, Bridgewater Township, Somerville County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 31, 1983, Ser. No. 528,035
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—200 **6 Claims**



1. In a memory array formed on a semiconductor chip comprising memory cells arranged in rows and columns, some of the rows being standard rows and N of the rows being initially spares to be substituted for standard rows which include defective cells, where N is an integer equal to or greater than 2; the improvement comprising:

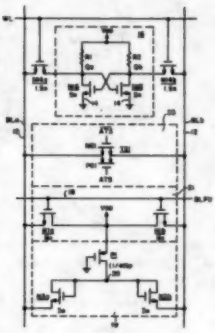
means for selectively substituting any one of said N spare rows for any one of said standard rows including means for encoding the spare rows in a predetermined order of priority and selectively substituting a spare row of higher priority for a spare row of lower priority.

4,639,898

BIT-LINE PULL-UP CIRCUIT

Donald J. Sauer, Allentown, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 21, 1984, Ser. No. 685,251
Int. Cl.[4] G11C 11/40
U.S. Cl. 365—202 **6 Claims**



1. In a memory array, a circuit for establishing a given potential on the bit lines of the memory array comprising:

first and second bit-lines for the application of complementary signals thereto;

a relatively high impedance, low power dissipation, static circuit coupled to said bit-lines tending to maintain the potential on said bit-lines at a first given potential, said relatively high impedance circuit comprising:

(a) a high impedance current limiting element having its conduction path connected between a point of operating potential and a first node;

(b) first and second diode-connected transistors having their conduction paths connected between said first node and said first and second bit lines, respectively; and

(c) said high impedance current limitigg element functioning to limit the voltage drop across said first and second diodes and maintaining the current therethrough a linear function of the applied voltage when either one of said first and second bit lines is short-circuited to a second potential; and

a pulsed precharge circuit coupled to said bit lines for momentarily precharging said bit-lines to said first given potential prior to a read or a write cycle, said precharge circuit having a much lower impedance than said static circuit for driving said bit lines to said first given potential quickly.

4,639,899

MEMORY CIRCUIT HAVING A MEMORY RESET AND RECOVERY CONTROLLER

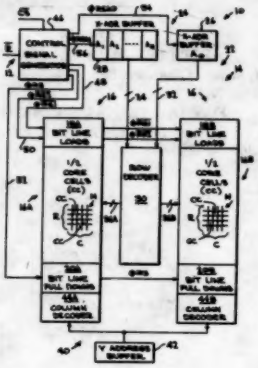
Colin N. Murphy, San Mateo, and Guey T. Lu, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 27, 1983, Ser. No. 536,920
Int. Cl.[4] G11C 7/00, 11/40
U.S. Cl. 365—230 **24 Claims**

1. A memory apparatus comprising;

a plurality of rows of bistable memory cells, each of said cells having a first and a second node coupled to a first and a second bit line, respectively,

means for discharging to a first predetermined potential, simultaneously, said first node of all of said cells via said first bit line; and



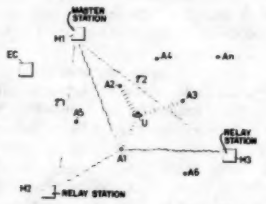
means for charging to a second predetermined potential, simultaneously, said second node of all of said cells via said second bit line after said first node of all of said cells has been discharged.

4,639,900

METHOD AND A SYSTEM FOR MONITORING A SEA AREA

Bengt G. Gustafson, Sigtuna, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1984, Ser. No. 582,424
Int. Cl.[4] G01S *3/80, 3/02*
U.S. Cl. 367—5 **4 Claims**



1. A method for locating a sound source in a water area, such method being for use in a system comprising:

at least three listening devices each provided with a hydrophone and a radio transmitter;

a radio master station to which signals indicating detection of sounds by the listening devices are transmitted and which determines the geographical position of the sound source by correlating the times of reception of such sound detection signals;

and at least two relay stations at fixed geographical positions relative to said master station; such method comprising the steps of:

transmission by each of the listening devices, alternatively, of radio signals identifying such devices, such identifying signals being received by the master station and the relay stations;

transmission by each of the listening devices, in respective radio channels, of said sound detection signals;

the relay stations relaying the identifying signals received thereby to the master station;

the master station processing the identifying signals received thereby directly from the listening devices and relayed from the relay stations to determine, from the relative times of reception of such signals, the geographical position of each of said listening devices;

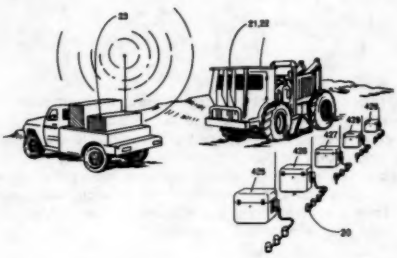
and the master station processing the sound detection signals received from each of the listening devices to determine the geographical position of the sound source with respect to said determined geographical positions of the listening devices, such processing being effected by correlating the relative times of reception of said sound detection signals.

4,639,901

METHOD FOR TESTING CABLELESS SEISMIC DIGITAL FIELD RECORDERS

Ralph E. Warmack, Kingwood, Tex., and William D. Woodruff, Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 29, 1982, Ser. No. 454,404
Int. Cl.[4] G01V *1/16;* **H04B** *17/00*
U.S. Cl. 367—13 **4 Claims**



1. A method for testing a cableless seismic digital recording system recorder capable of weighting and vertically stacking seismic-trace data for determining the operational status and for facilitating the maintenance of the recorder, comprising the steps of:

a. connecting the recorder to a source of test signals;

b. transmitting a coded signal to the recorder for selecting at least one weighting mode;

c. transmitting a coded signal to the recorder for initially activating the recorder to receive a first test signal;

d. acquiring the first test signal during the initial activation of the recorder;

e. weighting the acquired first test signal during the initial activation of the recorder according to the selected weighting mode;

f. transmitting a coded signal to the recorder for subsequently activating the recorder to receive a second test signal;

g. acquiring the second test signal during the subsequent activation of the recorder;

h. weighting the acquired second test signal during the subsequent activation of the recorder according to the selected weighting mode;

i. vertically stacking the weighted first and second test signals; and

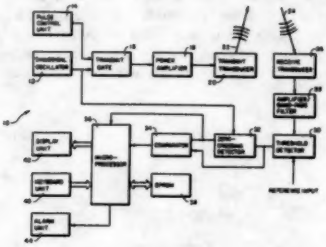
j. reproducing the weighted and vertically stacked first and second test signals for indicating the operability of the weighting mode.

4,639,902

NEAR ULTRASONIC PATTERN COMPARISON INTRUSION DETECTOR

Robert A. Leverance, College Park, and Socrates A. Longas, Glenndale, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1985, Ser. No. 748,366
Int. Cl.[4] G08B 13/16
U.S. Cl. 367—93 11 Claims



1. An intrusion detector apparatus for detecting an unauthorized entry in a room to be secured, comprising:

means for transmitting for a predetermined period transmitted signal(s), said means for transmitting being configured to repeat transmitting of the transmitted signal(s) at a predetermined interval(s) following the predetermined period; and

means for receiving received or return signal(s) during the predetermined interval in response to the transmitted signal(s) being reflecting from the walls, floor, ceiling or objects in the room to be secured, if present, said means for receiving including a microprocessor and being cofigured to detect, process and store a facsimile of the received signal(s) for the room to be secured when unoccupied, and then to continually compare facsimiles of subsequent received signal(s) therewith, according to a predetermined algorithm, so as to give a visual and/or audible indication of an unauthorized entry into the room to be secured, the predetermined algorithm operating to cause said microprocessor to indicate an alarm when there are two or more errors and/or unauthorized entry occurrences as determined by comparison between the stored facsimile and the current facsimile during at least three consecutive ones of the predetermined interval(s).

4,639,903

UNDERWATER SOUND DELIVERY SYSTEM

Michel Redolfi, c/o CIRM, 33 Avenue Jean Medecin, 0600 Nice, France

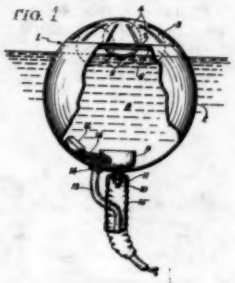
Filed Nov. 21, 1983, Ser. No. 553,527
Int. Cl.[4] H04R 1/44
U.S. Cl. 367—131 9 Claims

1. An underwater sound deliver apparatus which comprises:

a hollow sphere partially submerged in water;

said sphere being truncated to form an opening;

at least one sound transducer attached to the submerged portion of the sphere; and



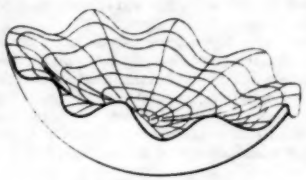
buoyant means for maintaining a portion of the sphere above water when water is admitted therein.

4,639,904

SONIC TRANSMITTERS

Rainer Riedlinger, Karlsruhe, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Jan. 29, 1986, Ser. No. 823,642
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510341
Int. Cl.[4] H04R 1/34
U.S. Cl. 367—140 21 Claims



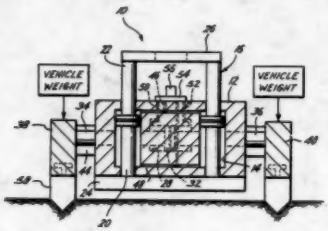
1. In a sound transmitter for generation of transient acoustic pulses, comprising a spatially curved focussing emitter surface which is represented by the area of at least one emitter, provided that where a plurality of emitters are used they are matched in respect of their period of operation and amplitude, the pulses generated in the focussed volume being engendered by a substantially unipolar and chronologically limited pulse on the emitter surface, an improvement characterised in that the emitter surface deviates from an ideal focussing emitter surface in such a way that as a consequence of the differences in the periods of operation caused by the areal deviation, the chronological rise and fall in the region of the focus of the velocity potential $\phi(t)$ calculable by means of the Rayleigh integral differ in speed in the region of the focus and that the bipolar pressure pulse $p(t)$ determined by derivation based on time from the substantially unipolar evolution of the velocity potential comprises a brief pulse of high amplitude and an adjacent longer pulse of lower amplitude.

4,639,905

DUAL-MODE VIBRATOR

Kent J. Goodloe, Sugarland, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Dec. 3, 1984, Ser. No. 677,292
Int. Cl.[4] H04R 11/00; G01V 1/00, 1/04
U.S. Cl. 367—189 1 Claim



1. A dual-mode vibrator assembly for selectively injecting P-waves and S-waves into the earth, comprising:

(a) an inertia mass having a plurality of cylinder bores therein parallel to a first direction and at least one cylinder bore therein essentially transverse to said first direction;

(b) a plurality of first piston members reciprocally disposed within each of said parallel cylinder bores;

(c) first means connected to said first piston members for contacting the earth;

(d) a second piston member reciprocally disposed within said at least one cylinder bore;

(e) second means connected to said second piston member for contacting the earth;

(f) means for selectively placing said first earth-contacting means or said second earth-contacting means in contact with the earth;

(g) means for directing said inertia mass to reciprocate parallel to said first direction when said first means is in contact with the earth, said means for directing said inertia mass to reciprocate parallel to said first direction having means for simultaneously supplying a fluid under pressure to said plurality of first piston members within each of said parallel cylinder bores when said first means is in contact with the earth;

(h) means for directing said inertia mass to reciprocate parallel to said second direction when said second means is in contact with the earth, said means for directing said inertia mass to reciprocate parallel to said second direction having means for supplying said fluid under pressure to said second piston member within said at least one cylinder bore when said second means is in contact with the earth; and

(i) means interconnecting said means for contacting the earth, and in sliding relationship with said inertia mass for preventing said inertia mass from rotating about said second piston member.

4,639,906

MAGNETIC RECORDING ON TRACKING CONTROLLED GROOVELESS MEDIUM HAVING MAGNETIC AND CAPACITANCE PROPERTIES

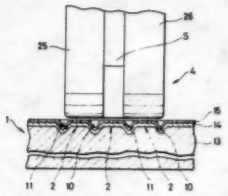
Kunio Goto, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Apr. 7, 1982, Ser. No. 367,033
Claims priority, application Japan, Apr. 7, 1981, 56-51957
Int. Cl.[4] G11B 13/00, 21/10
U.S. Cl. 369—14 7 Claims

7. A system for reproducing signals from a recording medum having an underlying layer of a ferromagnetic material formed with a series of minute pits along each of a plurality of laterally spaced apart, first and second, guide tracks to define therebetween a magnetic recording track, the minute pits on said first guide track being arranged to occur at a rate different from the rate of occurrence of those on the second guide track; and an overlying layer of a dielectric material, comprising:

means for moving said medium;

a pickup head comprising an electrode for acting upon said first and second guide tracks by contact with the surface of said medium, an electromagnetic transducer for reproducing signals from said magnetic recording track, said electrode and transducer being arranged on a common plane aligned with the magnetic recording track and a pair of wear resistant identical supports between which said electrode and said transducer are secured, said supports defining with said electrode and transducer a contact face with which the pickup head contacts the surface of said recording medium, said contact face having a width greater than the width of said magnetic recording track;



means for supplying ultrahigh frequency energy to said electrode and modulating the energy with capacitance variations which occur between said electrode and said recording medium at a rate corresponding to the rates of occurrence of said minute pits on said first and second guide tracks;

means for coupling said transducer to an external utilization circuit;

means for generating an error signal in response to said modulated ultrahigh frequency energy; and

means for controlling the position of said pickup head laterally with respect to said magnetic recording track in response to said error signal,

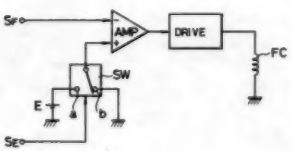
whereby signals are magnetically reproduced from said magnetic recording track of said recording medium.

4,639,907

MAGNETO-OPTICAL APPARATUS

Yoshio Aoki, Tokyo, and Yoshihiro Tsukamura, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,535
Claims priority, application Japan, Sep. 5, 1983, 58-162955
Int. Cl.[4] G11B 7/125
U.S. Cl. 369—45 2 Claims



1. A magneto-optical recording apparatus for use with a magneto-optical medium having a first amorphous layer recording layer comprising, a laser source producing a laser beam, means for projecting said laser beam onto said magneto-optical layer and a reflected laser beam produced thereby, an objective lens through which said laser beam and said reflected laser beam pass, means for generating a focus error signal, a focusing coil mounted so as to move said objective lens normal

to said magneto-optical medium in response to said focus error signal so that said laser beam is focused on said first layer of said magneto-optical medium during the recording mode of operation; a D.C. signal source, and adding means for adding said D.C. signal to said focus error signal during the erasing mode of operation so that the beam of said laser source is focused on a plane in front of said first layer of said magneto-optical medium and intelligence recorded on said first layer of said magneto-optical medium will be erased.

4,639,908

HIGH DENSITY INFORMATION RECORDS MADE OF CONDUCTIVE RESIN COMPOSITIONS COMPRISING INORGANIC POWER STABILIZERS

Kazuhira Namikawa; Toshiaki Hamaguchi; Mutsuaki Nakamura, and Akio Kuroda, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Dec. 7, 1984, Ser. No. 679,490

Claims priority, application Japan, Dec. 10, 1983, 58-232238

Int. Cl.⁴ G11B *23/00*

U.S. Cl. 369—288 **6 Claims**

1. A high density information record of an electrostatic capacitance type which comprises a record substrate on which signal information is recorded as geometric variations, the substrate being made of a conductive resin composition comprising a vinyl chloride resin, 5 to 30 parts by weight of a conductive powder and not greater than 10 parts by weight of an inorganic stabilizer capable of suppressing a dehydrochlorination reaction occurring in the vinyl chloride resin during a processing operation and capable of fixing hydrochloric acid produced during the operation, said inorganic stabilizer being selected from the group consisting of calcium hydroxide, basic aluminum magnesium carbonate hydrate and hydrotalcite and being in the form of a powder having an average size below 10 μm and an antacidic action, both based on 100 parts by weight of the vinyl chloride resin, whereby dropout defects of the record are greatly reduced.

4,639,909

DIGITAL SIGNAL DISTRIBUTOR

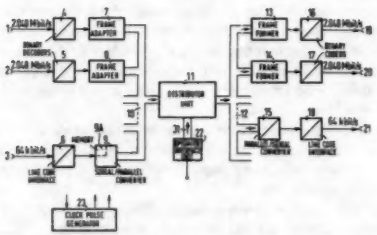
Heinrich Nirschl, Munich; Klaus Kamp, Neuried, and Baldur Stummer, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1984, Ser. No. 651,862

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, 3333775

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—58 **31 Claims**



1. A digital signal distribution circuit for time division multiplex signals each having a same frame format and for discrete channel signals comprising:

a plurality of frame adaptor means respectively connected to a plurality of inputs of said circuit, said frame adaptor means synchronizing and storing said time division multiplex signals for forming code words therefrom;

a memory and converter means connected to another input of said circuit for converting and storing said discrete channel signals and forming code words therefrom;

a distributor means having inputs respectively connected to outputs of said frame adaptor means and said memory and converter means respectively through a first bus and first discrete lines;

a clock pulse generator for cyclically controlling feed of code words into said first bus and said first discrete lines;

an operator interface means for entering setting information into said distributor means for controlling distribution of said code words by said distributor means; and

a second bus and second discrete lines connected to outputs of said distributor means and to respective outputs of said circuit to which code words distributed by said distributor means are supplied.

4,639,910

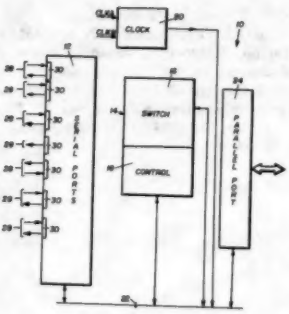
APPARATUS FOR ESTABLISHING COMMUNICATION PATHS

Herbert J. Toegel, Middlebury; Joseph R. Yudichak, and John F. Gilsdorf, both of Madison, all of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 682,228

Int. Cl.⁴ H04G *11/04*

U.S. Cl. 370—58 **24 Claims**



1. An apparatus for establishing communication paths comprising:

a plurality of duplex ports;

a switch, said switch having a switch controller associated therewith and

means for conveying information and instructions between said ports and said switch, said conveying means is a single internal TDM bus, said internal TDM bus interconnecting said switch with all of said duplex ports, said instructions being provided via any said duplex ports and conveyed via said internal TDM bus, whereby communication paths across said switch can be established according to said instructions.

4,639,911

HEAD-END AND RECEIVER FOR A SIGNAL DISTRIBUTION SYSTEM

Engel Roza, and Hendrik G. Van Veenendaal, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1983, Ser. No. 531,544

Claims priority, application Netherlands, Sep. 17, 1982, 8203599

Int. Cl.⁴ H04J *1/00*; H04N *7/04*; H04K *1/10*

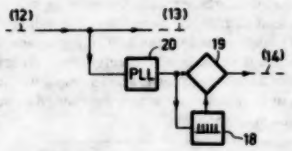
U.S. Cl. 370—69.1 **8 Claims**

1. In a receiver for processing received digital signals signifying a signal having a wide frequency band and a sub-carrier added to said signal having said wide frequency band, said

sub-carrier being modulated with a signal having a narrow frequency band, comprising

first digital-to-analog converter means for generating said signal having said wide frequency band in response to said received signal;

bandpass filter means for extracting said modulated sub-carrier from said received signal;



amplitude demodulator means connected to said bandpass filter means for generating a demodulated digital signal corresponding to said signal having said narrow frequency band; and

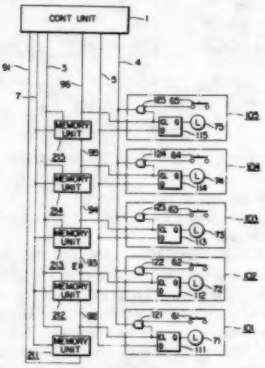
second digital/analog converter means connected to said amplitude demodulator means for converting said demodulated digital signal to said signal having said narrow frequency band.

4,639,912

SIGNAL TRANSMISSION APPARATUS

Junichi Tanino, Ichinomiya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,626
Claims priority, application Japan, Sep. 30, 1983, 58-182203
Int. Cl.[4] H04J 3/00; H04Q 3/00
U.S. Cl. 370—86 **10 Claims**



1. A signal transmission apparatus comprising:

a control unit for generating clock pulses and receiving signals representing external data through signal lines;

a plurality of signal terminal means respectively connected in parallel with said signal lines for transmitting said data signals;

pulse generator means provided in said control unit for generating said clock pulses;

a counter provided in said control unit for counting said clock pulses and generating a gate signal upon reaching a predetermined number of said clock pulses, said predetermined number being greater than the number of said signal terminal means;

a plurality of memory means corresponding to said plurality of signal terminal means and connected in series one after another from a starting terminal to a terminating terminal, including a starting memory means at the starting terminal and a terminating memory means at the terminating terminal connected to said control unit to constitute a closed loop, one of said starting and terminating memory means receiving and storing a first gate signal from said counter for subsequent transfer along a sending path to the remaining memory means responsive successively to said clock pulses;

detector means for detecting complete transfer of said first gate signal from said starting terminal to said terminating of said memory means before a next gate signal is generated; and

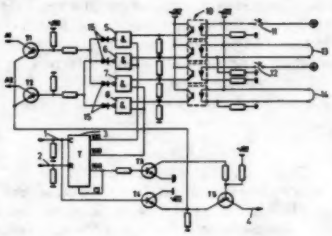
switching means for switching said sending path upon a detected result of said detector means so that the first gate signal is sent to one of said starting and terminating memory means.

4,639,913

METHOD AND EQUIPMENT FOR ELECTRONICALLY TRANSMITTING INFORMATIONS

Willy Rombaut, Leopoldstraat 55, 9400 Ninove-Okegem, Belgium

Filed Dec. 19, 1984, Ser. No. 683,672
Claims priority, application Belgium, Dec. 19, 1983, 898499
Int. Cl.[4] H04J 3/02
U.S. Cl. 370—90 **10 Claims**



1. Method for electronically transmitting informations, comprising the steps of:

generating a clock pulse series with a pulse generator which clock pulse series includes a plurality of clock pulses, each of which include at least one pulse;

transmitting said clock pulses on a common line said pulses being transmitted on a first end of said common line, and a second end thereof being coupled to a point near said first end, so that said common line is formed in a ring,

picking up the frontmost clock pulse at a first point on said common line and letting the ones of the clock pulses that follow said front-most clock pulse move along said common line;

performing an operation on the picked-up clock pulse which conveys thereto the information to be transmitted to form a treated pulse, and feeding such treated pulse to a common answer line;

performing picking-up and treating steps for frontmost clock pulses for all information to be transmitted;

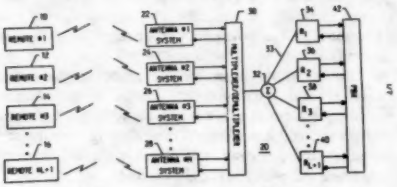
feeding the treated clock pulses on the answer line to a receiving means and separating the various treated pulses according to the clock sequence to make use of the information content thereof; and

using the first clock pulse to return the pick-up means to an original condition thereof and to cause the clock pulse generator to perform a new cycle after using the same for transmitting informations.

4,639,914
WIRELESS PBX/LAN SYSTEM WITH OPTIMUM COMBINING

Jack H. Winters, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 6, 1984, Ser. No. 679,067
Int. Cl.[4] H04J 3/12; H04Q 7/00; H04B 1/00
U.S. Cl. 370—110.1 9 Claims



1. A wireless system for communication between a base station and a plurality of terminals at locations remote from said base station, said system comprising in combination

means, including plural antennas for adaptive signal processing at said base station for interference suppression and separation of desired signals,

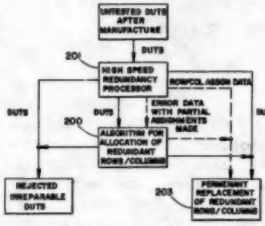
means for adaptive power control at transmitters located at said terminals for reducing interference to acceptable levels, and

means for adaptive retransmission with time division in the direction from said base station to said terminals for communications therebetween and for sending power control information to said terminals.

4,639,915
HIGH SPEED REDUNDANCY PROCESSOR

Gene P. Bosse, Newberry Park, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 539,511, Oct. 6, 1983, Pat. No. 4,586,178. This application Sep. 10, 1984, Ser. No. 648,674
Int. Cl.[4] G06F 10/20
U.S. Cl. 371—10 8 Claims



1. A system for testing a redundantly reparable array comprising:

means for detecting data representing the locations of faulty cells of the array during a testing sequence:

means for generating a redundancy signal representative of at least one redundant element available for repair of the faulty cells;

logic circuit means coupled to said detector means and to said signal generating means to provide an output array pattern during the testing sequence which selectively specifies replacement of said faulty cells with a redundant element;

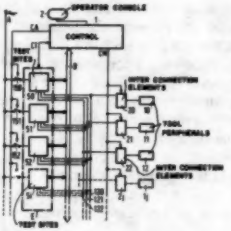
means for generating a signal indicative of a comparison between said redundancy signal and said output array pattern; and

abort circuit means coupled to said logic circuit means to provide an abort signal terminating the testing in accordance with said comparison signal.

4,639,916
AUTOMATIC METHOD AND MACHINE FOR THE SIMULTANEOUS TESTING OF DATA PROCESSING SYSTEMS

Daniel Boutterin, Bretigny; Jean-Paul Bertaux, Kremlin Bicêtre, and Alain Bader, Boulogne Billancourt, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 19, 1984, Ser. No. 622,348
Claims priority, application France, Jun. 22, 1983, 83 10315
Int. Cl.[4] G06F 11/26
U.S. Cl. 371—16 14 Claims



1. A method for testing a plurality of data processing systems, each by means of at least one test program from a first set of test programs, each data processing system comprising a central processing unit, a main memory, a stabilized power supply unit, and at least one control means for an associated peripheral device, and loading means for loading a test program in its main memory for execution by its central processing unit, each data processing system having an individual identification, said method being characterized by the following steps:

(a) providing a test machine for interconnection to said plurality of data processing systems, said test machine including a control unit, a power supply interconnection, a second set of tool peripherals controlled by an associated and selectable one of said control means, memory means for storing said first set of test programs and operator interface means;

(b) entering into said test machine the configuration data of each data processing system of said plurality of data processing systems as represented by the number and nature of the control means for peripheral devices thereof;

(c) automatic selecting by said test machine of specific test programs as a subset from said first set for execution in each data processing system as determined by said number and nature of said control means;

(d) executing said testing by recurrently executing the following substeps;

(d1) scanning the connection points of data processing systems interconnected to said test machine to determine the presence or absence of a system;

(d2) for a data processing system present and connected, scanning the set of specific test programs which can be selected to test said system;

(d3) for a specific test program selected, accessing any tool peripheral necessary for execution of the test program in question for determining the availability of said tool peripheral and in case of availability, allocating the tool peripheral in question to the data processing system in question;

(d4) in case of unavailability of any tool peripheral necessary, first, searching for any tool peripheral adapted as a substitute for the unavailable tool peripheral, second, in case of unavailability of any necessary substitute tool peripheral, disallocating any tool peripheral allocated

to the data processing system in question and thereupon scanning any remaining test program of said specific test programs for the data processing system in question for detecting an executability condition thereof as based on an availability of all necessary tool peripherals then allocated thereto, third, in case of absence of any executability condition for the data processing system in question, disallocating any tool peripheral allocated to the data processing system in question and returning to the substep of scanning the data processing system;

(d5) in case of detecting an executability condition, loading the test program in question into the main memory of the data processing system in question for subsequent execution thereby and returning to the substep of scanning the data processing systems;

(d6) in said data processing system executing said test program as isolated from any other scanning, availability detecting, executability detecting, or allocating substep, and after terminating said executing, signalling said terminating to said test machine;

(d7) upon receiving a terminating signal from a data processing system, disallocating in said test machine any tool peripheral then allocated to the data processing system in question and returning to the substep of scanning the data processing system;

(e) upon reaching an output condition, outputting test results from each test program executed, as represented by an OK/$\overline{\text{OK}}$ condition, a test identity, and an identification as to the tested data processing system.

4,639,917

FAULT DETERMINING APPARATUS FOR DATA TRANSMISSION SYSTEM

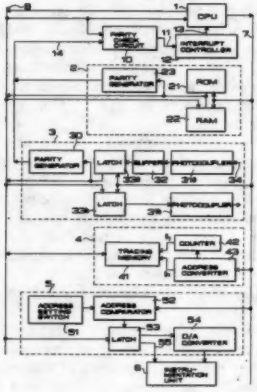
Michihiro Furuta, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,705

Claims priority, application Japan, Jun. 24, 1983, 58-114608

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—16 **5 Claims**



1. A fault determining apparatus for a data transmission system having a central processing unit (CPU) which transfers data to and from a main storage and an input/output unit through a data bus in accordance with information on an address command bus, said apparatus comprising:

parity generating means in each of said main storage and said input/output unit for generating and appending a parity bit to the data bus upon transfer of data bits from the respective main storage and input/output unit to the data bus,

parity checking means associated with the CPU and connected to the data bus for receiving the data bits and the parity bit and for generating a parity error signal when the parity of the received data bits does not correspond to the received parity bit,

a trace memory means connected to the data bus and the address command bus and including addressing means responsive to detection of predetermined signals on the address command bus for storing trace information of data received by said CPU from said main storage and said input/output units over a predetermined duration and for storing a transitional record of the logical state of a fault detection signal and the parity error signal from the parity checking means along with the stored data;

trace memory retrieval means for retrieving information stored in said trace memory means corresponding to stored data from a selected source address of said main storage and said input/output means along with the corresponding stored transitional record of the fault detection signal and the parity error signal; and

means for generating a record of said data transmission system based on said retrieved data and transitional record of said fault detection signal and said parity error signal retrieved by said trace memory retrieval means.

4,639,918

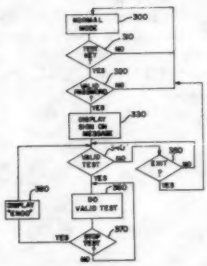
DIAGNOSTIC CONTROL KEYBOARD FOR A MAILING MACHINE

William J. Linkowski, Poughquag, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 18, 1985, Ser. No. 692,803

Int. Cl.[4] G06F *15/20, 11/00*

U.S. Cl. 371—20 **33 Claims**



1. A method of performing diagnostic testing in an automatic mailing machine having a plurality of subsystems and a control panel which includes a visual display and plurality of keys for control of the mailing machines functions during a normal mode of operation, the method comprising the steps of:

initiating a test mode in response to activating a predetermined key on the control panel;

transforming the control panel to function as a test selection panel in response to initiating the test mode;

generating a password signal in response to activating a predetermined sequence of control panel keys;

performing a selected one of a plurality of diagnostic tests in response to initiation of the test mode and generation of the password signal; and

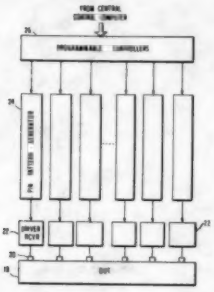
said mailing machine further including a photo-sensor and wherein one of the plurality of diagnostic tests comprises the steps of displaying a preselected set of characters on the visual display in response to blocking the photo-sensor, displaying a second preselected set of characters on the visual display in response to clearing the photo-sensor, and stopping the test in response to activation of a stop key.

4,639,919

DISTRIBUTED PATTERN GENERATOR

Yi-Hua E. Chang, Poughkeepsie; Algirdas J. Grnodis, Wappingers Falls; Hans P. Muhlfeld, Jr., Highland, all of N.Y.; Charles W. Rodriguez, Bethel, Conn., and Mark L. Shulman, Hyde Park, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1983, Ser. No. 564,853
Int. Cl.[4] G01R 31/28
U.S. Cl. 371—27 19 Claims



1. An apparatus for testing an array having a plurality of terminals, said apparatus testing said array by applying a sequence of test vectors to said array terminals with each said test vector including a plurality of bits each of which is applied to a respective one of said array terminals, each terminal receiving a serial pattern of bits as its respective portion of said sequence of vectors, said apparatus including a plurality of pattern generating means each for separately generating said pattern of bits for a respective one of said terminals, each said pattern generating means comprising pattern generator storage means for storing a plurality of basic pattern, and repetition control means for reading out said basic patterns, combinations of said basic patterns and sequences of said combinations of said basic patterns in order to obtain said serial pattern of bits, said repetition control means including address means for generating an address to said pattern generator storage means for reading out a pattern memory word stored at said address, said pattern memory word including at least one of said basic patterns and said pattern memory word further including control data for controlling the combinations and repetitions of basic patterns to be read out of said pattern generator storage means, and said repetition control means further comprising logic means responsive to said control data for controlling said address means to provide a desired sequence of addresses to said pattern generator storage means.

4,639,920

DATA INTERPOLATING CIRCUIT USING A TWO DATA WORD MEMORY

Takashi Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

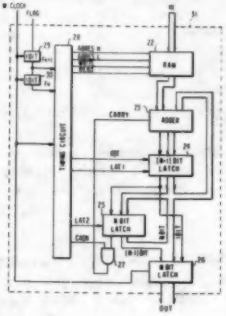
Filed Feb. 27, 1984, Ser. No. 584,262
Claims priority, application Japan, Feb. 25, 1983, 58-31481
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—31 17 Claims

1. A data interpolating circuit under control of a source of clock signals for interpolating an erroneous data word which is contained in a plurality of digital data words in a received digital bit stream, each data word being constituted by a plurality of bits and being accompanied by an error-flag bit, said circuit comprising:

an error-flag latch means connected to remove said error flag bits and said clock signals for temporarily storing both an error-flag bit added to an n-th data word and an error-flag bit added to an (n+1)th data word, where n stands for an integer of two or more;

a memory circuit connected to receive said digital bit stream and consisting of first and second memory regions for storing two data words;

a timing circuit means connected to receive said clock signals and signals stored in said error flag latch means and to provide control signals to said memory circuit for controlling the operation of writing an input data word into said first memory region and of transferring a data word stored in said first memory region to said second memory region in accordance with the data stored in said error-flag latch means whereby, at a given point in time, a correct data



word is stored in said first memory region and the last occurring correct data is stored in said second memory region;

an arithmetic circuit connected to said memory circuit and said timing circuit means for performing an arithmetic operation on the data words read out from said memory circuit in accordance with the data stored in said error-flag latch means and an output of said timing circuit means; and

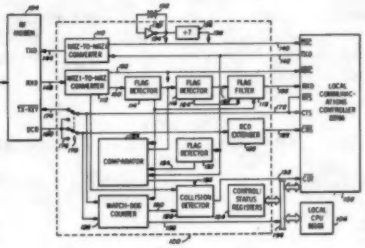
an output latch means connected to said arithmetic circuit for temporarily storing the result of the arithmetic operation and providing the result as an output under control of said clock signals.

4,639,921

METHOD AND AN APPARATUS FOR EARLY BIT COLLISION DETECTION

Joseph M. Gang, San Jose, and Mitchell B. Bain, Mountain View, both of Calif., assignors to Sytek, Inc., Mountain View, Calif.

Filed Jan. 9, 1985, Ser. No. 690,114
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—53 5 Claims



1. A method of serially transmitting bits in a network and receiving echo bits from the network to provide early detec-

tion of bit collision, the method comprising in combination the steps of:

serially transmitting the bits;

developing a running count of said bits as they are being transmitted beginning at least from a first predetermined one of said bits;

developing a running check sum of said bits as they are being transmitted beginning at least from a second predetermined one of said bits;

serially receiving said bits;

developing a running count of said bits as they are being received at least from said first predetermined bit;

developing a running check sum of said bits as they are being received at least from said second predetermined bit;

at a time at least when a third predetermined one of said bits is being received, storing the current transmitted-bit count;

at said third predetermined bit time, storing the current transmitted-bit-check sum;

comparing the current received-bit count to the stored-bit count; and

when the current received-bit count equals said stored-bit count, comparing the current received-bit-check sum to the stored-bit-check sum to detect a bit collision.

4,639,922

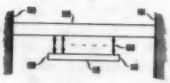
SINGLE MODE INJECTION LASER STRUCTURE

Stewart E. Miller, Middletown Township, Monmouth County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 28, 1984, Ser. No. 655,257

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—19 **22 Claims**



1. An injection laser which comprises:

a laser cavity having a main mode,

an active laser region disposed within the laser cavity,

means for injection pumping the active laser region to produce laser radiation, and

auxiliary light guiding means disposed in a physical relationship with said active laser region so that laser radiation is coupled therebetween in order to provide a wavelength selective energy loss in said active laser region, wherein a value of loss at the wavelength of the main mode is less than its value at the wavelengh of modes other than the main mode.

4,639,923

OPTICAL PARAMETRIC OSCILLATOR USING UREA CRYSTAL

Chung L. Tang, Ithaca, N.Y., and William F. Donaldson, Pittsford, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 21, 1984, Ser. No. 612,756

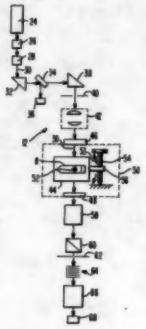
Int. Cl.[4] H01S 3/10

U.S. Cl. 372—21 **16 Claims**

1. A tunable optical parametric oscillator, comprising:

a pump source producing a pump beam at a first frequency and a first wavelength;

a resonant cavity incorporating a nonlinear organic crystal aligned with and responsive to said pump beam to produce at least an output signal beam at a second frequency



and a second wavelength which is longer than said first wavelength; and

means for adjusting the angle of said crystal with respect to said pump beam to tune said oscillator in order to vary the frequency and wavelength of said output signal beam.

4,639,924

DRIVE SYSTEM FOR A SEMICONDUCTOR LASER

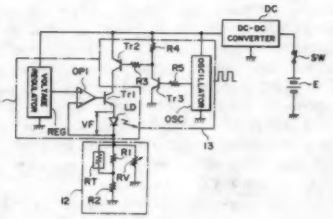
Tokuichi Tsunekawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,174

Claims priority, application Japan, Sep. 3, 1982, 57-154131; Sep. 3, 1982, 57-154132; Apr. 7, 1983, 58-61452; Apr. 7, 1983, 58-61453

Int. Cl.[4] H01S 3/13

U.S. Cl. 372—33 **5 Claims**



1. A semiconductor laser driving circuit comprising:

(a) a semiconductor laser having two terminals;

(b) a transistor having a first terminal connected to one terminal of said laser, a second terminal arranged for connection to an electric power source and a control terminal;

(c) an operational amplifier having one input terminal for accepting a reference voltage and another input terminal connected to the other terminal of said laser, an output of said operational amplifier being connected to said control terminal of said transistor;

(d) a temperature compensation resistance circuit connected to a junction of said other terminal of said laser and said other input terminal of said operational amplifier; and

(e) an adjusting resistance connected in parallel with said temperature compensation resistance circuit.

4,639,925

SEMICONDUCTOR LASER

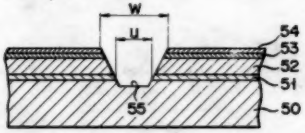
Haruki Kurihara, Tokyo; Minoru Sagara; Kenji Matumoto, both of Yokohama, and Hideo Tamura, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 24, 1984, Ser. No. 603,453

Claims priority, application Japan, Apr. 27, 1983, 58-72933; Apr. 27, 1983, 58-72934

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—46 17 Claims



1. A semiconductor laser comprising:

(i) a semiconductor base structure including a GaAs substrate provided with an etched channel, a channel deformation-preventing layer formed of $Ga_{1-x}Al_xAs$ ($0.1 \leqq x \leqq 1$) and formed on the surface of said substrate except over said channel, said channel deformation-preventing layer having a thickness of 0.2 μm or less, and an oxidation-preventing layer formed of GaAs and formed on the surface of said channel deformation-preventing layer;

(ii) a laminated semiconductor structure formed on said base structure and including a lower cladding layer formed on the surface of said semiconductor base structure including said channel, an active layer formed on the surface of said lower cladding layer, and an upper cladding layer formed on the surface of said active layer; and

(iii) an electrode means for applying current to said active layer.

4,639,926

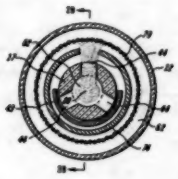
EFFICIENT CATHODE ASSEMBLY FOR METAL VAPOR LASER

Shing C. Wang, Arcadia, and Randolph W. Hamerdinger, Glendora, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 9, 1980, Ser. No. 158,000

Int. Cl.[4] H01S 3/097

U.S. Cl. 372—87 22 Claims



1. A metal vapor laser tube for generating simultaneous multi-line emissions comprising:

a gas-filled envelope having a longitudinal axis, said gas including as a portion thereof a given metal vapor, an anode electrode forming a portion of said envelope;

a cathode assembly comprising a perforated hollow cathode located within said envelope and coaxially disposed with respect to said anode electrode portion of said envelope and concentric therewith, a metal member positioned with respect to said hollow cathode, said metal member when vaporized providing said given metal vapor, and an insulator member in contact with said metal member;

an anode screen interposed between said anode electrode and said cathode assembly and electrically coupled to said anode electrode;

coaxially aligned end members, said end members and said envelope being adapted to provide a structure for confining a gaseous medium therein;

means for generating a dc voltage; and

means for applying said dc voltage between said anode screen and said cathode assembly whereby a discharge between said cathode and said anode screen is created, said gas being excited by said discharge for stimulating continuous wave, simultaneous multi-line emissions along the longitudinal axis of said cathode.

4,639,927

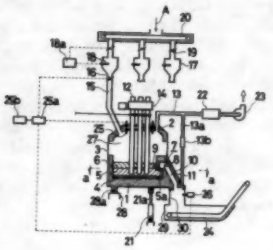
CONTINUOUS MELT ELECTRIC FURNACE WITH CONTINUOUS DISCHARGE

Kunihiko Uno, Hirakata; Kunihiro Nakazato, Takatsuki; Masahide Nishigaki, Miki; Hajime Hirotomi, Kakogawa; Shigeo Kimura, Kobe; Sadao Kurihara, Kosugimachi; Hideo Tanaka, Takaoka; Jiro Mihara, Tokyo, and Kiyoaki Takai, Takaoka, all of Japan, assignors to Kabushiki Kaisha Takuma, Osaka and Nihon Jukagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 23, 1985, Ser. No. 757,985

Int. Cl.[4] F27D 3/14

U.S. Cl. 373—84 8 Claims



1. An electric melting furnace for receiving unmolten combustion residue, continuously melting said combustion residue to produce molten substances, and continuously discharging said molten substances, said furnace comprising:

a furnace body having an exit on a sidewall thereof through which said molten substances are discharged and a plurality of electrodes extending downwardly into said furnace body,

said exit comprising an upwardly extending overflow dam and a downwardly extending blocking plate located inwardly of said overflow dam, said blocking plate blocking the outflow of unmolten combustion residue from said furnace;

said exit being positioned substantially colinearly with the center of said furnace body and one of said electrodes,

said dam being spaced from said one electrode by a distance L where

$$L = 1.6 \times \frac{1}{K} \sqrt{\frac{4}{3} \times \frac{P}{\pi}}$$

where L is expressed in centimeters, P is the electric furnace load in Watts and K is a constant in the range of 16 to 25 $Watt^{\frac{1}{2}} \cdot cm^{-1}$.

4,639,928

DISC MEANS FOR AN ELECTRODE FOR USE IN ELECTRIC ARC FURNACES

Claudio Conradty, Röthenbach/Pegnitz; Dieter Zöllner, Schwaig/Nürnberg; Inge Lauterbach-Dammler, Nuremberg, and Thomas Taube, Erlangen-Steudach, all of Fed. Rep. of Germany, assignors to Arc Technologies Systems Ltd., Grand Cayman, Cayman Islands

Filed Mar. 12, 1984, Ser. No. 588,788

Claims priority, application Switzerland, Mar. 22, 1983, 1545/83

Int. Cl.[4] H05B *7/08*

U.S. Cl. 373—93 **11 Claims**

1. In an arc furnace electrode, having an upper-metallic, water-cooled electrode holder, surrounded by a protective jacket resistant to elevated temperature and mechanical stress, and a consumable section, threadably connected to the electrode holder by means of a threaded nipple, the improvement comprising a disc arranged between the metallic part of the electrode holder and the consumable section, said disc being attached to or carried by said metallic part while being in covering contact with a lower front plate of said metallic part of the electrode holder, with the disc being formed from a material having good electrical conductivity and resistance to thermal and mechanical stress, said disc having a central aperture having a diameter essentially corresponding to the diameter of the threaded nipple.

4,639,929

CONTINUOUS METHOD OF GRAPHITIZING LONG CARBON-CONTAINING PRODUCTS AND A FURNACE FOR CARRYING OUT THE METHOD

Jean-Claude Bernard, Sainte-Foy-les-Lyon, France; Patrick Chabrier, La Corogne, Spain; Bernard Tahon; Jean-Marc Tesoriere, both of Le Fayet, France, and Domingo Ortega, Paris, France, assignors to Societe des Electrodes et Refractaires "Savoie" (SERS), Paris, France

PCT No. PCT/FR83/00200, § 371 Date Jun. 6, 1984, § 102(e) Date Jun. 6, 1984, PCT Pub. No. WO84/01368, PCT Pub. Date Apr. 12, 1984

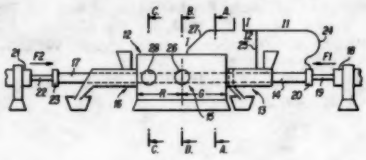
PCT Filed Oct. 4, 1983, Ser. No. 619,591

Claims priority, application France, Oct. 6, 1982, 82 17020

Int. Cl.[4] H05B *3/60*

U.S. Cl. 373—120 **20 Claims**

1. A method for continously graphitizing a long pre-cooked carbon-containing product, comprising passing the said carbon-containing product through the inside of a furnace in a column, and heating the said column of carbon-containing product by the Joule effect to a temperature of at least 2500° C., wherein the said column of carbon-containing product is arranged substantially horizontally, and wherein the said furnace is packed with a fragmented carbon-containing material which is maintained within the furnace.



4,639,930

PORT FOR GRAPHITIZATION FURNACE

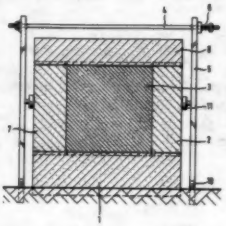
Ulrich Kandzia, Bad Soden, Fed. Rep. of Germany, assignor to Sigri GmbH, Meitingen, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 698,930

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404322

Int. Cl.[4] H05B *3/00*

U.S. Cl. 373—120 **14 Claims**



1. Port for a graphitizing furnace, particularly for a longitudinal graphitizing oven, comprising refractory masonry and an electrode set into the masonry, said masonry formed of a bottom section, lateral blocks and a yoke, said electrode resting on the bottom section and the yoke resting on the electrode, and a clamping device comprising a tierod, a lever and a spring clamping the lateral blocks to the electrode.

4,639,931

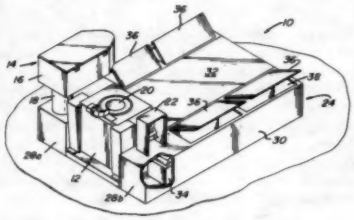
INDUCTION FURNACE PACKAGING SYSTEM

John H. Mortimer, Medford, N.J., assignor to Inductotherm Industries, Inc., Rancocas, N.J.

Filed Aug. 1, 1985, Ser. No. 761,272

Int. Cl.[4] H05B *5/00*

U.S. Cl. 373—138 **3 Claims**



1. A packaging system for an induction furnance comprising:

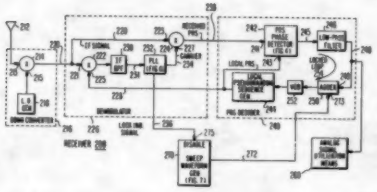
(a) housing means having a base, side walls and a top wall, the base, top and side walls defining an enclosed space,
(b) an induction furnace contained substantially within the enclosed space,
(c) furnace operating equipment centrally located within the enclosed space and defining spaces between the furnace operating equipment and side walls of the housing means,
(d) access means in the top wall adjacent the spaces between the furnace operating equipment and the side walls for providing access to the spaced and access to the furnace operating equipment from the sides thereof while preventing access to the furnace operating equipment from the top thereof,
(e) induction furnace charging means mounted on the housing means adjacent the induction furnace and pivotable with respect thereto for charging the induction furnace with metal to be melted, and
(f) furnace control housing means mounted on the top wall and adjacent the induction furnace.

4,639,932

CLOCK RATE SPREAD SPECTRUM

Leonard N. Schiff, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 29, 1985, Ser. No. 770,561
Int. Cl.[4] H04K *1/02*
U.S. Cl. 375—1 **10 Claims**



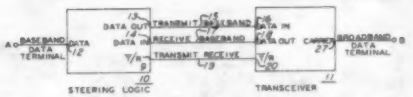
1. A decoder for a direct-sequence spread spectrum signal encoded with a first pseudorandom sequence the clock rate of which is modulated by analog information, comprising:
a rate-controllable oscillator for generating variable-rate clock signals;
a local pseudorandom sequence generator coupled to said rate controlled oscillator for being clocked thereby to produce a local rate-variable pseudorandom sequence, said local pseudorandom sequence corresponding to said first pseudorandom sequence;
phase detecting means including (a) first and second mixing means, each of which includes a first and second input terminals and an output terminal, said first input terminals of said first and second mixing means being coupled together and to receive said spread-spectrum signal, said second input terminal of said first mixing means being coupled to said local pseudorandom sequence generator for receiving said local pseudorandom sequence, (b) delay means coupled between said second input terminal of said first mixing means and second input terminal of said second mixing means for delaying said local pseudorandom signal applied to said second mixing means, (c) first and second lowpass filters coupled to said output terminals of said first and second mixing means, respectively and (d) differencing means coupled to said output terminals of said first and second low pass filters for receiving filtered mixed signals therefrom for generating a control signal equal to the difference between said filtered mixed signals;
loop filter means coupled to said differencing means portion of said phase detecting means for averaging said control signal to generate a filtered control signal;
coupling means coupled to said loop filter means and to said rate-controlled oscillator for closing a degenerative feedback loop for maintaining said first and local pseudorandom sequences in phase coherence, whereby said filtered control signal manifests said analog information; and
information utilizing means coupled to said filter means for receiving as said analog information said filtered control signal.

4,639,933

STEERING LOGIC CIRCUIT FOR A DIGITAL DATA TRANSCEIVER

Edward K. Howell, Simsbury, and Thomas E. Anderson, Avon, both of Conn., assignors to General Electric Company, Portsmouth, Va.

Continuation of Ser. No. 561,483, Dec. 14, 1983, abandoned.
This application Oct. 29, 1985, Ser. No. 792,239
Int. Cl.[4] H04L *5/16*
U.S. Cl. 375—8 **6 Claims**



1. Steering logic for interconnecting a transceiver with a baseband bus, said transceiver being connected to a broadband bus for transmitting or receiving modulated carrier wave signals on said broadband bus, said transceiver having data in and data out terminals for inputting or outputting digital signals at baseband and at least one control terminal for receiving a control signal, said transceiver being responsive to said control signal for enabling or disabling transmitting or receiving functions of said transceiver, said steering logic comprising:
a baseband bus terminal to which baseband digital transmit signals may be applied and to which baseband digital receive signals from said transceiver are applied;
a buffer connected between the data out terminal of said transceiver and said baseband bus terminal; and
logic means having inputs connected to said baseband bus terminal and the data out terminal of said transceiver and an output connected to said at least one control terminal, said logic means being responsive to baseband digital transmit signals applied to said baseband bus terminal for generating said control signal to enable the transmitting function and to disable the receiving function of said transceiver.

4,639,934

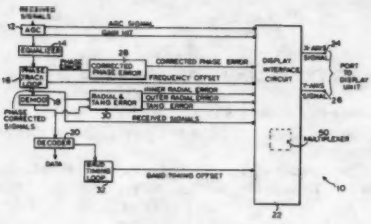
LINE IMPAIRMENT DISPLAY FOR DIGITAL MODEMS

Edward S. Zuranski, Largo; Robert E. Scott, Clearwater, and William L. Betts, St. Petersburgh, all of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Apr. 11, 1985, Ser. No. 722,295
Int. Cl.[4] H04B *3/46*
U.S. Cl. 375—10 **6 Claims**

1. A modem receiver for generating binary data signals from quadrative amplitude modulated received signals comprising:
means for converting said received signals into in-phase and quadrature components;
means for generating error signals corresponding to said received signals; and
display interface means for combining said in-phase and quadrature components and said error signals to generate

display two orthogonal signals defining a composite image; said composite image comprising a signal constellation having points corresponding to said in-phase and



quadrature components mapped into a complex plane and a plurality of monitoring points disposed at predetermined positions and corresponding to said error signals.

4,639,935

APPARATUS FOR CORRECTING FREQUENCY-DEPENDENT ATTENUATION OF THE TRANSMITTING MEDIUM IN SIGNAL TRANSMISSION

Göran Jarnestedt, Johanneshov, and Rolf von Campenhausen, Lidingö, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

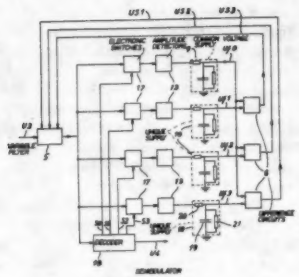
PCT No. PCT/SE84/00368, § 371 Date Jun. 19, 1985, § 102(e) Date Jun. 19, 1985, PCT Pub. No. WO85/02509, PCT Pub. Date Jun. 6, 1985

PCT Filed Oct. 31, 1984, Ser. No. 749,533

Claims priority, application Sweden, Dec. 2, 1983, 8306671

Int. Cl.[4] H04L *27/28*

U.S. Cl. 375—11 3 Claims



1. In a transmission system wherein digital information represented by signals with n-different frequencies is transmitted through a medium which attenuates the signals based on their frequencies, apparatus for correcting the frequency-dependent attenuation of such signals comprising:

a variable filter means, having a signal input for receiving such signals, an output for transmitting controllably attenuated signals and n−1 control inputs for controlling the attenuation of signals received at said signal input by an amount determined by the presence of a control signal at one of said control inputs,

common voltage generating means connected to the output means of said variable filter means for generating a common voltage signal which is a function of the amplitude of signals having a first of the n-different frequencies,

n−1 other voltage generating means connected to the output means of said variable filter means, each of said n−1 voltage generating means generating a voltage signal which is a function of the amplitude of such signals having one of the n−1 frequencies different from said first frequency,

n−1 difference circuit means, each of said difference circuit means having a first input connected to the common voltage generating means to receive the common voltage signal, each of said n−1 difference circuit means having a second input connected to a different one of said n−1 voltage other voltage generating means to receive the voltage signal generating thereby, and each of said n−1 difference circuit means having an output for generating said control signal which is a function of the difference in amplitude between the voltage signals received at the inputs thereof,

and means for connecting the respective outputs of said n−1 difference circuit means to respective control inputs of said variable filter means.

4,639,936

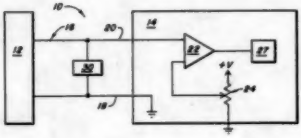
DATA TRANSMISSION SIGNAL APPARATUS

Thomas C. Hogan, Natick, and Arnold Adelman, Berlin, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 10, 1984, Ser. No. 579,093

Int. Cl.[4] H04L *25/06*

U.S. Cl. 375—36 10 Claims



1. In a data communication transmission system having an signal transmitter; an analog signal receiver having a threshold element, with a selected threshold value, for receiving a transmitted signal said transmitted signal including a succession of interspersed relatively high and relatively low peak voltages and having transitional voltages between said high and low peak voltages; and a transmission link directly interconnecting said transmitter and said receiver;

a data transmission signalling apparatus comprising

voltage clamping means connected directly across said transmission link at a receiver connection for clamping voltages appearing at a receiver input between a minimum clamped voltage less than a minimum expected voltage equal to the lowest expected relatively high peak voltage appearing on the transmission link at the receiver and a maximum clamped voltage greater than a maximum expected voltage equal to the hightest expected relatively low peak voltage appearing on the transmission link at the receiver, said minimum and maximum clamped voltages being set symmetrically about said threshold value.

4,639,937

HF AVALANCHE RELAY COMMUNICATION TECHNIQUE

Daniel D. McRae, West Melbourne, and Joseph B. Cain, III, Indialantic, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Dec. 7, 1983, Ser. No. 559,091

Int. Cl.[4] H04B *7/15*

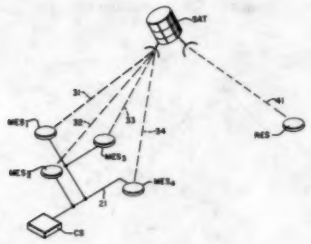
U.S. Cl. 375—40 15 Claims

1. For use in a communication network having a plurality of stations between which communications are to take place, a method of conveying a message from a message originating station to one or more of a plurality of recipient stations of said network for whom the message is intended comprising the steps of:

(a) transmitting a message from said originating station; and

(b) at said originating station and at all stations in said net-

work that have received said message, each of said stations being capable of simultaneously receiving at the same receiver thereat signals that have been transmitted from multiple sites and utilizing each received signal to obtain information contained therein representative of



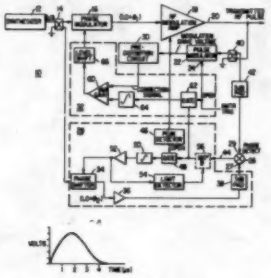
said originally transmitted message so as to derive the originally transmitted message regardless of the amplitude, phase and time of arrival of each of the received signals, simultaneously retransmitting said message on the same carrier frequency.

4,639,938

RF PULSE TRANSMITTER HAVING INCIDENTAL PHASE MODULATION (IPM) CORRECTION

Scott W. Kennett, West Jordan, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed Nov. 6, 1985, Ser. No. 795,407
Int. Cl.[4] H04L *25/49*
U.S. Cl. 375—60 **11 Claims**



1. An RF pulse transmitter having incidental phase modulation (IPM) correction, comprising:

means for generating a carrier signal having a predetermined frequency;

means for generating a modulation drive signal;

means responsive to the modulation drive signal for generating an RF pulse at the predetermined frequency;

means for generating a reference signal at the predetermined frequency;

means for receiving the RF pulse and the reference signal and in response thereto generating a phase error signal;

said means for generating a reference signal including means for adjusting the phase of the reference signal to thereby drive the phase error signal to a predetermined value at a pulse peak of the RF pulse;

means responsive to the modulation drive signal for generating a pre-modeled correction signal for use in correcting for the incidental phase modulation (IPM); and

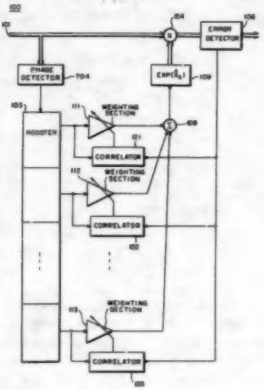
means responsive to the phase error signal for applying a portion of the correction signal to the means for generating an RF pulse to correct for the incidental phase modulation.

4,639,939

APPARATUS FOR CANCELLING PERIODIC CARRIER PHASE JITTERS

Botaro Hirosaki, and Osamu Tanaka, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,656
Claims priority, application Japan, Feb. 20, 1984, 59-29735; Dec. 28, 1984, 59-277477
Int. Cl.[4] H04L *7/02*; H03L *7/00*
U.S. Cl. 375—118 **12 Claims**



1. An apparatus for removing a periodic carrier phase jitter from a complex baseband signal, comprising:

means for detecting sequential carrier phases of the complex baseband signal;

storing means for storing said detected carrier phases;

phase predicting means responsive to outputs of said storing means for producing a predicted carrier phase;

means for compensating for a carrier phase deviation of said complex baseband signal in response to said predicted carrier phase and for producing a phase deviation compensated complex baseband signal;

error detecting means responsive to said phase deviation compensated complex baseband signal for detecting an error;

means for controlling said phase predicting means in response to said error to minimize said error.

4,639,940

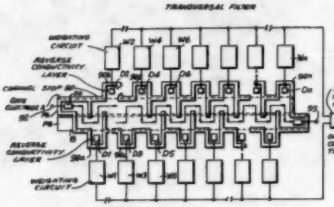
CHARGE COUPLED DEVICE WITH MEANDER CHANNEL AND ELONGATED, STRAIGHT, PARALLEL GATE ELECTRODES

Osamu Ohtsuki, Kobe, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 332,241, Dec. 18, 1981, Pat. No. 4,531,225, which is a continuation of Ser. No. 887,655, Mar. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 735,639, Oct. 26, 1976, abandoned. This application May 8, 1985, Ser. No. 731,797
Claims priority, application Japan, Oct. 31, 1975, 50-131941; Dec. 24, 1975, 50-153232; Dec. 29, 1975, 50-156876
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[4] G11C *19/28*; H01L *29/78*; H03H *15/02*
U.S. Cl. 377—60 **2 Claims**

1. A charge coupled device having a semiconductor substrate of predetermined conductivity type, said substrate hav-

ing a surface, a pair of substantially band-shaped channel stops formed on the substrate surface and extending in spaced substantially parallel relation, said channel stops comprising a high impurity concentration layer of the predetermined conductivity type formed on said substrate surface, a charge transfer area of a uniform conductivity type bounded by the band-shaped channel stops, a plurality of short channel stops alternately extending from each of the band-shaped channel stops toward the center of the charge transfer area, each of the short channel stops terminating at a predetermined space from the opposing band-shaped channel stop, the short channel stops comprising the high impurity concentration layer of the predetermined conductivity type formed on said substrate surface in an interdigitated pattern with the channel stops, a plurality of cells each comprising a small area between next-adjacent short channel stops of a corresponding one of the band-shaped channel stops, said cells being staggered along said charge coupled



device, means for forming an asymmetrical depletion layer in each of said cells in a regular arrangement to determine a transfer direction of the charge, a film of electrically insulative material covering the charge transfer area, and a pair of elongated substantially straight parallel gate electrodes over said insulative film, one of said gate electrodes commonly covering the cells of one of the band-shaped channel stops and the other of said gate electrodes commonly covering the cells of the other of the band-shaped channel stops thereby forming a single directional meander-shaped charge transfer channel of said uniform conductivity type in the charge transfer area under said pair of gate electrodes free from any other electrode, said gate electrodes having a side; and

a signal device at the side of said gate electrodes and providing a connection path for a signal charge through said one of said band-shaped channel stops, thereby eliminating electrode crossover.

4,639,941

RADIOGRAPHY

Godfrey N. Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 13,476, Feb. 21, 1979, Ser. No. 858,612, Dec. 8, 1977, Pat. No. 4,188,541, and Ser. No. 869,711, Jan. 16, 1978, which is a continuation of Ser. No. 758,147, Jan. 10, 1977, abandoned, which is a continuation of Ser. No. 481,443, Jun. 20, 1974, Pat. No. 4,035,647, which is a division of Ser. No. 358,980, May 10, 1973, Pat. No. 3,881,110, said Ser. No. 858,612, is a division of Ser. No. 780,791, Mar. 24, 1977, abandoned, which is a continuation of Ser. No. 657,543, Feb. 12, 1976, Pat. No. 4,052,618, which is a division of Ser. No. 468,005, May 7, 1974, Pat. No. 3,944,833, which is a division of Ser. No. 349,198, Apr. 9, 1973, Pat. No. 3,866,047, which is a continuation-in-part of Ser. No. 212,778, Dec. 27, 1971, Pat. No. 3,778,614, which is a continuation of Ser. No. 861,358, Aug. 21, 1969, abandoned. This application May 14, 1984, Ser. No. 609,521

The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

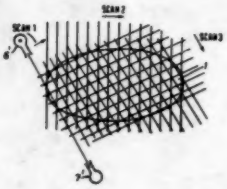
Int. Cl.[4] G01N *23/06*

U.S. Cl. 378—11 **73 Claims**

3. In an apparatus for obtaining a 3-D tomograph of a body to be examined:

means for directing a divergent beam of penetrating radiation through the body to be examined from a source on one side of the body to a detector on the other side of the body;

means for detecting the divergent penetrating radiation that is passed through the body at a number of angularly spaced positions within the angle subtended by the divergent beam as a function of the relative angular position of



the divergent beam relative to the body to derive sets of detected radiation data representative of sets of angularly spaced divergent ray shadowgrams of absorption or transmission of the divergent penetrating radiation by the body with different ones of said angularly spaced sets of divergent ray shadowgram data corresponding to different sets of intersecting rays of divergent penetrating radiation.

4,639,942

PROCEDURE FOR MEASURING THE QUANTITY OF SILICON COATING ON PAPER OR CARDBOARD

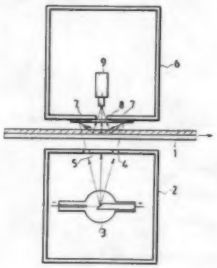
Pertti Puumalainen, Kuopio, Finland, assignor to Enso-Gutzeit Oy, Helsinki, Finland

Continuation of Ser. No. 624,934, Jun. 27, 1984. This application Mar. 17, 1986, Ser. No. 840,390

Claims priority, application Finland, Jun. 28, 1983, 832344

Int. Cl.[4] G01N *23/223*

U.S. Cl. 378—045 **7 Claims**



1. A procedure for on-line measuring of the quantity of silicon coating on paper or cardboard moving as a continuous web and having a first face surface and an oppositely directed second face surface with the silicon coating formed on the first face surface thereof, comprising the steps of producing a primary x-ray radiation with a primary radiation source located on and spaced outwardly from the second face surface of the web, directing the primary radiation through the web from the second face surface to the first face surface and then to a secondary radiation source on the first face surface side of the web and spaced closely outwardly from the web, the secondary radiation source comprising an element having ordinal number higher than that of silicon, and exciting with said primary radiation the characteristic x-ray radiation of said element, directing the characteristic x-ray radiation excited in the secondary radiation source obliquely into the first face surface of

the web and thereby exciting the characteristic x-ray radiation of the silicon contained in the silicon coating, collecting the excited characteristic x-ray radiation of silicon in a detector spaced outwardly from the first face surface side of the web, and registering by said detector said excited characteristic x-ray radiation as an indication of the amount of silicon coating, and providing screen means on the first face surface side of the web between the primary radiation source and the web for selectively passing the primary x-ray radiation from the primary radiation source at an oblique angle to the second face surface of the web and then through the web to the secondary radiation source while preventing the primary the x-ray radiation from passing directly through the web to the detector.

4,639,943

X-RAY DIAGNOSTIC SYSTEM WITH AUTOMATIC CONTROL OF RADIATION EXPOSURE

Udo Heinze, Nuernberg, and Paul Marhoff, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 694,957

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402888

Int. Cl.[4] H05G 1/44

U.S. Cl. 378—96 **7 Claims**

1. An x-ray diagnostic system having an x-ray tube, a voltage source for operating said x-ray tube, and a control loop for controlling at least one radiographic exposure parameter of said x-ray tube, said control loop comprising:

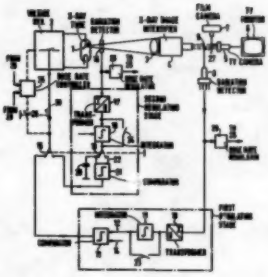
a first radiation detector disposed for detecting an x-ray image of an examination subject;

a first regulating stage connected to an output of said first radiation detector for controlling said parameter based on said first radiation detector output, said first regulating stage having an output;

a second radiation detector disposed before said examination subject in the direction of radiation propagation;

a second regulating stage for controlling said parameter based on said second radiation detector output having a memory supplied through a first switch in a first switching position with a signal derived from said output of said second radiation detector and storing said signal, and a switching unit having a signal input, a reference input connected to said memory, and an output which is the output of said second regulating stage; and

a second switch operated simultaneously with said first switch, said second switch in a first switching position connecting said output of said first regulating stage to said



voltage source for operating said x-ray tube, and when switched to a second switching position disconnecting said output of said first regulating stage and connecting said output of said second regulating stage to said voltage source for operating said x-ray tube, said first switch when simultaneously switched to a second switching position supplying said signal derived from said output of said second radiation detector to said signal input of said switching unit for thereafter maintaining said parameter at a value stored in said memory.

DESIGN PATENTS

GRANTED JAN. 27, 1987

ERRATA

For CLASS	See PATENT NO.
D29-022	287,904
D14-053	287,964
D99-028	288,011

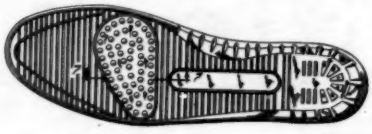
DESIGNS

JANUARY 27, 1987

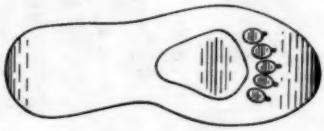
287,900
PROTECTIVE CAP
Sam S. Sherman, Erie, Pa., assignor to Sherman & Gray, Gastonia, N.C.
Filed Dec. 24, 1984, Ser. No. 686,038
Term of patent 14 years
U.S. Cl. D2—247

287,901
NOVELTY SUN VISOR
Jennifer Laughlin, Clearwater, Fla., assignor to B. O. Wyss, St. Louis; E. L. Wyss, Alton and R. G. Heywood, St. Louis, all of, Mo., part interest to each
Filed Apr. 27, 1984, Ser. No. 604,381
Term of patent 14 years
U.S. Cl. D2—252

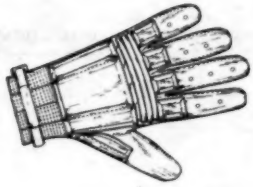
287,902
INSOLE
James A. Forsyth, Stow, Ohio, assignor to Sorbothane, Inc., Kent, Ohio
Filed Jan. 22, 1985, Ser. No. 693,622
Term of patent 14 years
U.S. Cl. D2—318

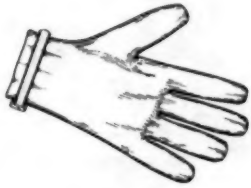


287,903
SHOE SOLE
Michael R. Jones, and Samuel N. Jones, both of 8534 N. Tyler, Portland, Oreg. 97203
Filed Jan. 25, 1985, Ser. No. 695,164
Term of patent 14 years
U.S. Cl. D2—321



287,904
ATHLETIC GLOVE
Alfred R. Pierce, Jr., 25 Argyle Ave., Blackwood, N.J. 08012
Filed Dec. 31, 1984, Ser. No. 687,745
Term of patent 14 years
U.S. Cl. D29—22

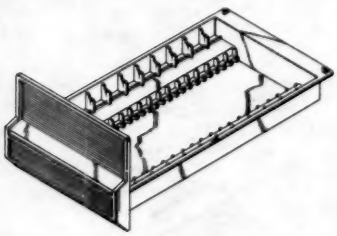




287,905
HOLDER FOR A PAGER
Takashi Oyamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed May 17, 1984, Ser. No. 611,555
Claims priority, application Japan, Nov. 17, 1983, 58-50052
Term of patent 14 years
U.S. Cl. D3—106

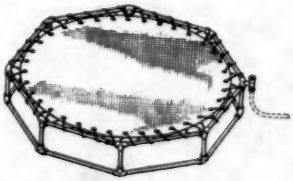
287,906
TRAVEL CASE FOR AN ELECTRIC SHOE POLISHING KIT OR THE LIKE
Masao Tsuji, Old Lyme, and William J. Rakocy, Madison, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Nov. 9, 1984, Ser. No. 669,982
Term of patent 14 years
U.S. Cl. D3—30.5

287,907
MAGNETIC TAPE STORAGE DRAWER
Jackson Yu, Taipei, Taiwan, assignor to Worthy Industrial Inc., Taipei, Taiwan
Filed Jul. 10, 1984, Ser. No. 629,463
Term of patent 14 years
U.S. Cl. D3—35

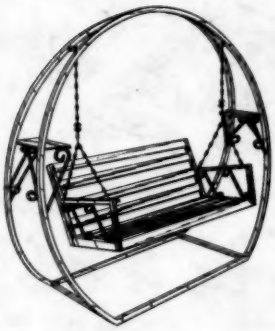


287,908
HANGER
Saul Fox, 19 Sulgrave Crescent, Willowdale, Ontario, Canada M2L 1W5
Filed May 10, 1984, Ser. No. 609,057
Claims priority, application Canada, May 1, 1984, 01-05-84-9
Term of patent 14 years
U.S. Cl. D6—328

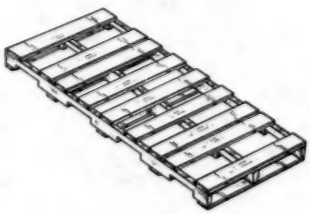
287,909
RECREATIONAL LOUNGE
Samuel M. Weiss, 9037 Burton Way, Los Angeles, Calif. 90048
Filed Mar. 26, 1984, Ser. No. 593,372
Term of patent 14 years
U.S. Cl. D6—329



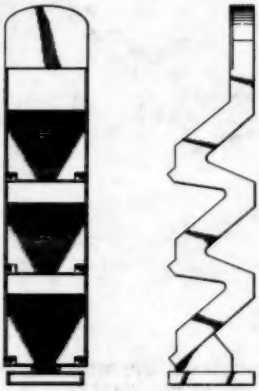
287,910
COMBINED SWING AND PLURAL SHELF UNIT
Glenn Schlarb, 1322 Mill St., Alva, Okla. 73717
Filed Jan. 16, 1984, Ser. No. 570,842
Term of patent 14 years
U.S. Cl. D6—347



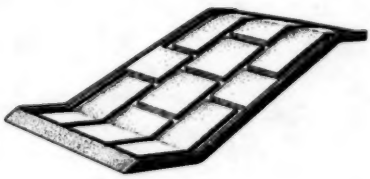
287,911
PALLET
Norman J. Teixeira, Santa Maria, Calif., assignor to Teixeira Farms, Inc., Santa Maria, Calif.
Filed Apr. 30, 1984, Ser. No. 605,196
Term of patent 14 years
U.S. Cl. D6—382



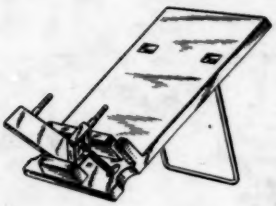
287,912
DISPLAY STAND
Pietro Ferrero, Genese, Belgium, assignor to Ferrero S.p.A., Alba, Italy
Filed Jun. 29, 1984, Ser. No. 626,028
Term of patent 14 years
U.S. Cl. D6—408



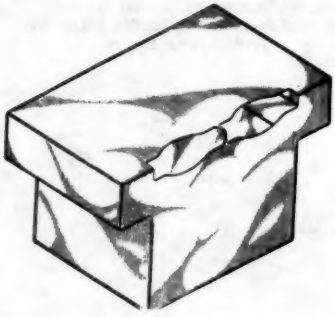
287,913
CARPET DISPLAY STAND
James L. Knight, Rte. 7, Cumming, Ga. 30130, and Christopher C. Bidwell, 342 Summer Pl., Norcross, Ga. 30071
Filed Jan. 26, 1984, Ser. No. 574,027
Term of patent 14 years
U.S. Cl. D6—409



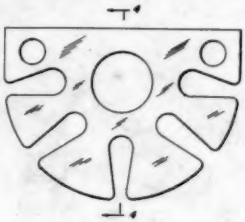
287,914
FOLDABLE BOOK SUPPORT
Peter Woolf, Sparta, N.J., assignor to Spartan International Corporation, Sparta, N.J.
Filed Oct. 25, 1984, Ser. No. 664,616
Term of patent 14 years
U.S. Cl. D6—419



287,915
COMBINED SHELVES AND DISPENSER FOR DISPOSABLE DIAPERS
John F. Bonczek, and Linda D. Bonczek, both of 6993 NW. 5th Ct., Margate, Fla. 33063
Filed Apr. 9, 1984, Ser. No. 598,226
Term of patent 14 years
U.S. Cl. D6—515



287,916
WALL MOUNTED BRACKET FOR USE IN BEAUTY SALONS AND THE LIKE
Andrea F. DelGarbino, and David L. DelGarbino, both of 2120 Arms Dr., Girard, Ohio 44420
Filed Feb. 13, 1984, Ser. No. 579,513
Term of patent 14 years
U.S. Cl. D6—567



287,917

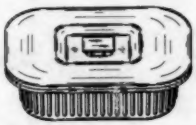
MICROWAVE OVEN COVERED DISH

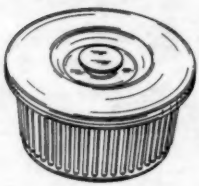
James F. Pomroy, St. Paul; Allen M. Danley, Eagan, and Harry A. Rubbright, Mendota Heights, all of Minn., assignors to Plastics, Inc., St. Paul, Minn.

Filed Nov. 19, 1984, Ser. No. 672,715

Term of patent 14 years

U.S. Cl. D7—18





287,918

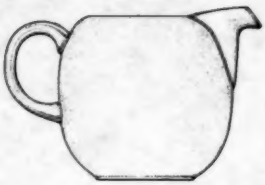
CREAM PITCHER

Robin Levien, London, England, assignor to American Commercial, Incorporated, Secaucus, N.J.

Filed Dec. 28, 1983, Ser. No. 566,220

Term of patent 14 years

U.S. Cl. D7—19



287,919

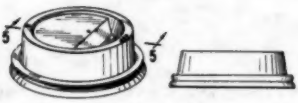
DRINKING CUP LID

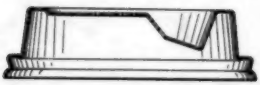
Jack D. Clements, Ada, Okla., assignor to Solo Cup Company, Highland Park, Ill.

Filed Aug. 22, 1984, Ser. No. 643,072

Term of patent 14 years

U.S. Cl. D7—40

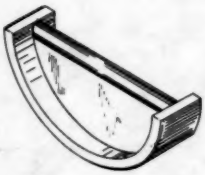




287,920
CONTAINER HOLDER
James R. Lasier, 1013 Forest Ridge, Garland, Tex. 75042
Filed Sep. 14, 1984, Ser. No. 650,524
Term of patent 14 years
U.S. Cl. D7—70

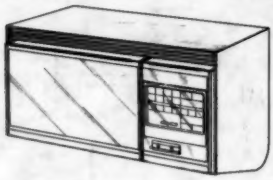
287,921
THERMALLY INSULATED FOOD BAG
Ingrid Skamser, Hoffman Estates, Ill., assignor to Thermal Bags by Ingrid, Inc., Chicago, Ill.
Filed Feb. 7, 1984, Ser. No. 577,693
Term of patent 14 years
U.S. Cl. D7—77

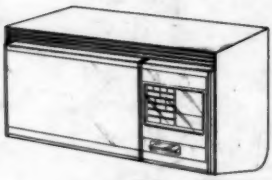
287,922
COFFEE FILTER SEPARATING UTENSIL
David R. Bremer, 446 E. Birch, Canton, Ill. 61520
Filed Apr. 16, 1984, Ser. No. 600,544
Term of patent 14 years
U.S. Cl. D7—99



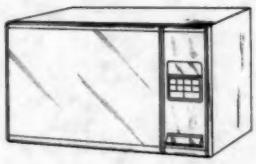
287,923
COFFEE POT
Tapio Wirkkala, Helsinki, Finland, assignor to Rosenthal Aktiengesellschaft Rechtsabteilung, Fed. Rep. of Germany
Filed Jul. 30, 1984, Ser. No. 635,430
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 7363
Term of patent 14 years
U.S. Cl. D7—321

287,924
MICROWAVE OVEN
Masayoshi Kubo; Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 19, 1984, Ser. No. 632,366
Claims priority, application Japan, Jan. 19, 1984, 59-1614; Jan. 19, 1984, 59-1615
Term of patent 14 years
U.S. Cl. D7—351

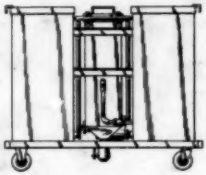


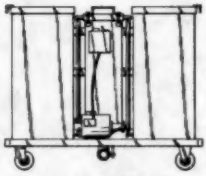


287,925
MICROWAVE OVEN
Masayoshi Kubo; Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 19, 1984, Ser. No. 632,176
Claims priority, application Japan, Jan. 19, 1984, 59-1616
Term of patent 14 years
U.S. Cl. D7—351

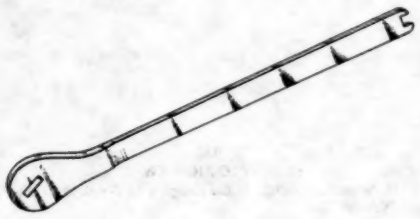


287,926
MACHINE FOR FILTERING LUBRICATING OIL FOR A DOUGH DIVIDER MACHINE
D. L. Adcock, 6412 S. Douglas Ave., Oklahoma City, Okla. 73139
Filed Feb. 27, 1984, Ser. No. 584,018
Term of patent 14 years
U.S. Cl. D7—368



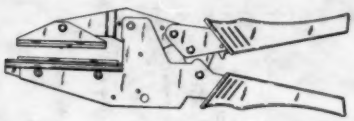


287,927
COMBINATION GAS MAIN VALVE AND WATER MAIN VALVE WRENCH
Andrew J. Zankich, 356 Virginia St., #304, El Segundo, Calif. 90245
Filed Oct. 12, 1984, Ser. No. 661,235
Term of patent 14 years
U.S. Cl. D8—17

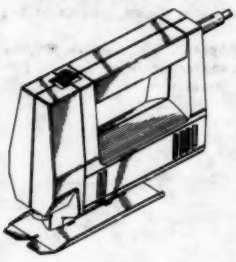


287,928
PIVOTED JAW WRENCH
Kiyoshi Watanabe, Sanjo, Japan, assignor to Top Kogyo Co., Ltd., Niigata, Japan
Filed Apr. 12, 1984, Ser. No. 599,538
Claims priority, application Japan, Jan. 25, 1984, 59-2159
Term of patent 14 years
U.S. Cl. D8—22

287,929
CRIMPING TOOL
Jan O. Higg, Stenhamra, and Lars-Olov Persson, Älvdalen, both of Sweden, assignors to Pressmaster Tool AB, Älvsaden, Sweden
Filed Feb. 14, 1984, Ser. No. 579,961
Term of patent 14 years
U.S. Cl. D8—51



287,930
ELECTRIC JIG SAW
Robert I. Somers, Raleigh, N.C., assignor to Black & Decker, Inc., Newark, Del.
Filed Apr. 2, 1984, Ser. No. 595,611
Term of patent 14 years
U.S. Cl. D8—64



287,931
MOUNTING BLOCK
Jerry L. Crone, Batesville, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.
Filed Jan. 30, 1985, Ser. No. 696,611
Term of patent 14 years
U.S. Cl. D8—373

287,932
PACKAGING CONTAINER FOR BEVERAGES
Barry Seward, 33 Carleton Close, Hook, Hampshire; Paul Woolman, "Glenwood", Firtree Avenue, Stoke Poges, Buckinghamshire; Kevin C. Pope, 25 Winchfield Gardens, Tadley, Hampshire; Digby R. Redshaw, 12 Edward Street, Warwick, Warwickshire; Malcolm B. Hastings, 2 Overstreet, Court House Green, Coventry, Warwickshire, and Malcolm D. N. Withnall, "The Barn", Lighthorne Rough, Moreton Morrell, Warwickshire, all of United Kingdom
Filed Nov. 22, 1983, Ser. No. 554,186
Claims priority, application United Kingdom, May 27, 1983, 1013312
Term of patent 14 years
U.S. Cl. D9—305

287,933
BOTTLE
Frederick G. W. Mills, North Walsham, and Michael Piercy, Wandsworth, both of England, assignors to United Glass Limited, Middlesex and Universal Wines & Spirits Limited, London, both of, England
Filed Oct. 10, 1986, Ser. No. 623,229
Term of patent 14 years
U.S. Cl. D9—349

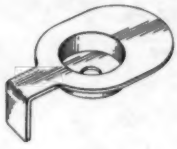
287,934
PLASTIC BOTTLE FOR LIQUIDS
Robert M. Harris, Jr., Reseda, Calif., assignor to McKesson Corporation, San Francisco, Calif.
Filed Sep. 25, 1984, Ser. No. 654,754
Term of patent 14 years
U.S. Cl. D9—370

287,935
BOTTLE
Frank W. Bech, 11, Kokkedal Industripark, DK-2980 Kokkedal, Denmark
Filed Apr. 2, 1984, Ser. No. 595,677
Claims priority, application Denmark, Oct. 25, 1983, 1007/83
Term of patent 14 years
U.S. Cl. D9—372

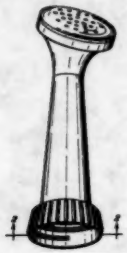
287,936
BOTTLE
Frederick G. W. Mills, Norfolk, and Michael Piercy, London, both of England, assignors to United Glass Limited, Middlesex and Universal Wines & Spirits Limited, London, both of, England
Filed Jun. 21, 1984, Ser. No. 623,228
Term of patent 14 years
U.S. Cl. D9—372

287,937
BOTTLE
Charles L. Sargent, Ann Arbor; Michael W. Larime, Dexter, and John R. Selina, Ypsilanti, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.
Filed Aug. 29, 1984, Ser. No. 645,464
Term of patent 14 years
U.S. Cl. D9—375

287,938
RETENTION WASHER
Isaac Sachs, 1240 Ridgewood Drive, Chomedey, Laval, Quebec, Canada H7W 1L3
Filed Jun. 15, 1984, Ser. No. 621,098
Term of patent 14 years
U.S. Cl. D9—439



287,939
SPRINKLER SPOUT CLOSURE
Walter D. Harman, 6990 Bucktrout Pl., Worthington, Ohio 43085
Division of Ser. No. 568,042, Jan. 4, 1984. This application May 21, 1986, Ser. No. 865,618
Term of patent 14 years
U.S. Cl. D9—447

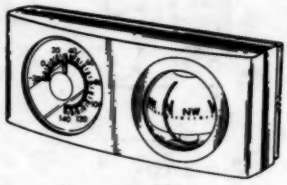


287,940
BOWLING PIN CLOCK
Wilbur E. DeGroff, 908 Anton Rd., Plymouth, Wis. 53073
Continuation-in-part of Ser. No. 545,447, Oct. 26, 1983, abandoned. This application May 8, 1985, Ser. No. 731,977
Term of patent 14 years
U.S. Cl. D10—6

287,941
CLOCK
Fernando C. Richards, 56 Peabody St., Salem, Mass. 01970
Filed Feb. 23, 1984, Ser. No. 583,057
Term of patent 14 years
U.S. Cl. D10—7

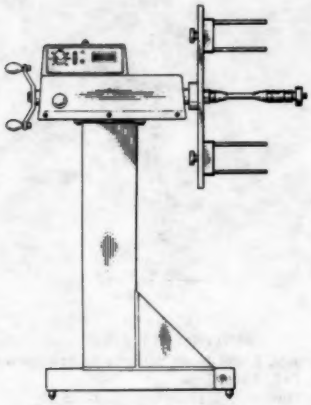
287,942
COMBINED THERMOMETER AND COMPASS UNIT FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Dec. 11, 1984, Ser. No. 680,373
Claims priority, application Japan, Nov. 8, 1984, 59-46.052
Term of patent 14 years
U.S. Cl. D10—53

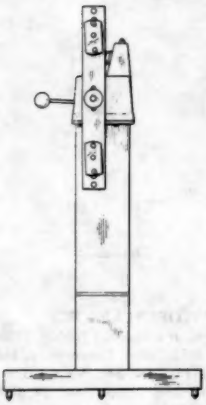
287,943
COMBINED THERMOMETER AND COMPASS UNIT FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Dec. 11, 1984, Ser. No. 680,374
Claims priority, application Japan, Nov. 8, 1984, 59-46.053
Term of patent 14 years
U.S. Cl. D10—53



287,944
CONSTRUCTION TOOL
Leslie R. Hewston, 12106 Rocker Rd., Nevada City, Calif. 95959
Filed Jul. 9, 1984, Ser. No. 629,158
Term of patent 14 years
U.S. Cl. D10—64

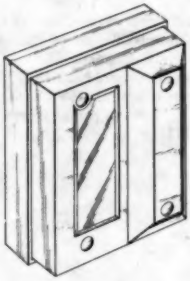
287,945
WHEEL BALANCING MACHINE
Hyo-Sup Park, 387 Laurelwood Rd., Santa Clara, Calif. 95050
Filed Oct. 7, 1983, Ser. No. 540,146
Term of patent 14 years
U.S. Cl. D10—82



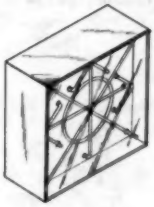


287,946
COMPUTERIZED MULTIPLE FUNCTION BICYCLE METER
Sadaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Japan
Filed Apr. 20, 1984, Ser. No. 602,619
Claims priority, application Japan, Nov. 9, 1983, 58-48764
Term of patent 14 years
U.S. Cl. D10—98

287,947
HOUSING FOR A REMOTE METER DISPLAY
Irwin A. Hicks, Radnor, and Joseph P. Schroeck, Cheltenham, both of Pa., assignors to The Singer Company, Stamford, Conn.
Filed May 4, 1984, Ser. No. 607,083
Term of patent 14 years
U.S. Cl. D10—102

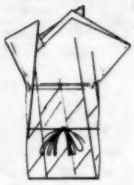


287,948
TRAFFIC LIGHT
Edwin C. Evans, 47 Colonial Pkwy., Manhasset, N.Y. 11030
Filed Dec. 24, 1984, Ser. No. 685,758
Term of patent 14 years
U.S. Cl. D10—115

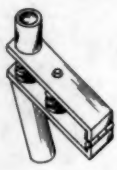


287,949
NECKLACE
Gianni Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed May 11, 1984, Ser. No. 609,289
Claims priority, application Italy, Nov. 17, 1983, 36.232B/83
Term of patent 14 years
U.S. Cl. D11—6

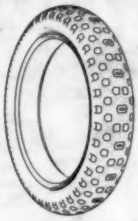
287,950
VASE
Donald E. Weder; Erwin Weder, both of Highland, and Robert C. Abrams, Edwardsville, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Sep. 21, 1984, Ser. No. 653,033
Term of patent 14 years
U.S. Cl. D11—143



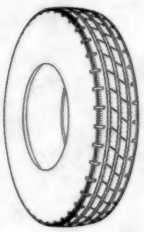
287,951
BICYCLE SEAT POST WITH SPRING SUPPORT
Richard H. Yerkes, 2647 Skyview Ave., Langhorne, Pa. 19047
Filed Jun. 26, 1986, Ser. No. 879,169
Term of patent 14 years
U.S. Cl. D12—119



287,952
MOTORCYCLE TIRE
Junichi Kawajiri, and Toshio Hayakawa, both of Tokyo, Japan, assignors to Bridgestone Corporation, Japan
Filed May 29, 1984, Ser. No. 615,023
Claims priority, application Japan, Nov. 30, 1983, 58-51630
Term of patent 14 years
U.S. Cl. D12—136



287,953
AUTOMOBILE TIRE
Akihiro Takeuchi, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Oct. 4, 1984, Ser. No. 657,518
Claims priority, application Japan, Aug. 29, 1984, 59-36127
Term of patent 14 years
U.S. Cl. D12—146



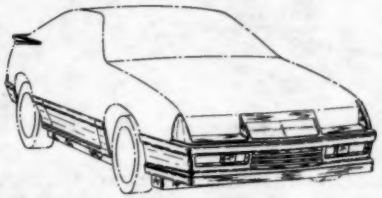
287,954
MOTORCYCLE TIRE
Atsushi Tomura, Tokyo, and Hideaki Nishio, Saitama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Sep. 17, 1984, Ser. No. 651,130
Claims priority, application Japan, Mar. 29, 1984, 59-11925
Term of patent 14 years
U.S. Cl. D12—147

287,955
MOTORCYCLE TIRE
Toshio Hayakawa, and Atsushi Tomura, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 3, 1984, Ser. No. 677,277
Claims priority, application Japan, Jun. 1, 1984, 59-22295
Term of patent 14 years
U.S. Cl. D12—147

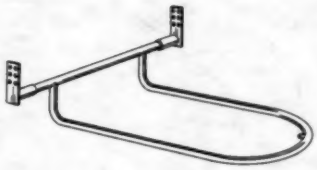
287,956
MOTORCYCLE TIRE
Hideaki Nishio, Saitama, and Kazuo Matsuda, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 3, 1984, Ser. No. 677,278
Claims priority, application Japan, Jun. 1, 1984, 59-22294
Term of patent 14 years
U.S. Cl. D12—147

287,957
MOTORCYCLE TIRE
Toshio Hayakawa; Atsushi Tomura, both of Tokyo, and Hideaki Nishio, Saitama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 3, 1984, Ser. No. 677,279
Claims priority, application Japan, Jun. 1, 1984, 59-22302
Term of patent 14 years
U.S. Cl. D12—147

287,958
AUTOMOBILE BUMPER
William A. Dayton, Northville; John E. Crain, Birmingham, and Steven N. Bollinger, West Bloomfield, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.
Filed Dec. 19, 1983, Ser. No. 562,810
Term of patent 14 years
U.S. Cl. D12—169

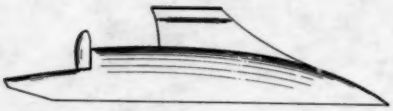


287,959
SPARE TIRE CARRIER
William A. Hooper, Jr., 6910 Sycamore, Kansas City, Mo. 64133
Filed Dec. 14, 1984, Ser. No. 681,607
Term of patent 14 years
U.S. Cl. D12—202

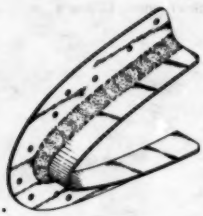


287,960
WHEEL COVER
Boyke Boyer, Wessling, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany
Filed May 10, 1984, Ser. No. 609,015
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, MR 13665
Term of patent 14 years
U.S. Cl. D12—211

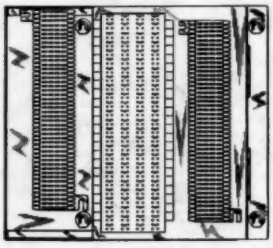
287,961
BOAT HULL
Leonard M. Greene, White Plains, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.
Filed Aug. 31, 1984, Ser. No. 646,203
Term of patent 14 years
U.S. Cl. D12—300



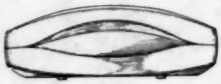
287,962
BRACE FOR STABILIZER OF V-TAIL AIRCRAFT
George V. Brechtbill, Wilton, Calif., and Charlie O. Nicolos, 3501 East View Dr., Shingle Springs, Calif. 95682, assignors to Charlie O. Nicolos, Shingle Springs, Calif.
Filed May 17, 1984, Ser. No. 611,238
Term of patent 14 years
U.S. Cl. D12—345



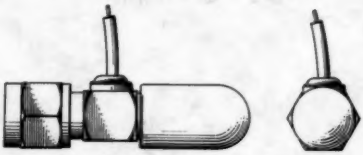
287,963
BUILDING TELEPHONE ENTRANCE TERMINAL
Michael Fasano, Syosset, and Paul De Luca, Plandome Manor, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.
Filed Apr. 16, 1984, Ser. No. 601,031
Term of patent 14 years
U.S. Cl. D13—24



287,964
HOUSING FOR A TELEPHONE HANDSET AND STAND UNIT
George Perkins, Burbank, Calif., assignor to TeleQuest, Inc., Burbank, Calif.
Filed Nov. 23, 1984, Ser. No. 674,173
Term of patent 14 years
U.S. Cl. D14—53

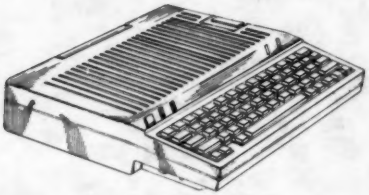


287,965
COMBINED HOUSING FOR BIAS COMPONENTS AND CONNECTOR THEREFOR
John E. Kasianowicz, Newton, and Michael L. Landes, Brockton, both of Mass., assignors to GTE Government Systems Corporation, Waltham, Mass.
Filed Jun. 13, 1984, Ser. No. 620,300
Term of patent 14 years
U.S. Cl. D13—99



287,966
COIN-OPERATED TELEPHONE BOX
Robert V. Albertson, Wayzata, Minn., assignor to Burd, Bartz & Gutenkauf, Minneapolis, Minn.
Filed Jul. 18, 1985, Ser. No. 756,772
Term of patent 14 years
U.S. Cl. D14—55

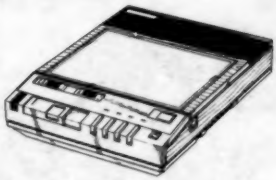
287,967
PERSONAL COMPUTER HOUSING
Rob J. Gemmell, Santa Clara; Hartmut H. Esslinger, and Stephen Peart, both of Los Gatos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Apr. 17, 1984, Ser. No. 601,179
Term of patent 14 years
U.S. Cl. D14—100



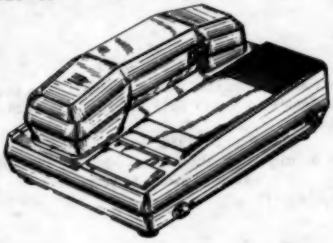
287,968
COMPUTER WORKSTATION
Edward C. Ng, San Jose, Calif., and William M. Casnovsky, Austin, Tex., assignors to Motorola Computer Systems, Inc., Cupertino, Calif.
Filed Aug. 1, 1984, Ser. No. 636,534
Term of patent 14 years
U.S. Cl. D14—106

287,969
PORTABLE ELECTRONIC COMPUTER
Takashi Kusanagi, Ota, Japan, assignor to Ampere Incorporated, Tokyo, Japan
Filed Sep. 7, 1984, Ser. No. 648,068
Claims priority, application Japan, May 2, 1984, 59-17841
Term of patent 14 years
U.S. Cl. D14—106

287,970
TELEPHONE ANSWERING MACHINE
Noriaki Kaku, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 19, 1984, Ser. No. 591,087
Claims priority, application Japan, Sep. 29, 1983, 58-42480
Term of patent 14 years
U.S. Cl. D14—4



287,971
CORDLESS HANDSET AND STAND TELEPHONE UNIT
Raymond G. Bond, Long Beach, Calif., assignor to Fortel, Inc., Compton, Calif.
Filed Jul. 30, 1984, Ser. No. 635,919
Term of patent 14 years
U.S. Cl. D14—53



287,972

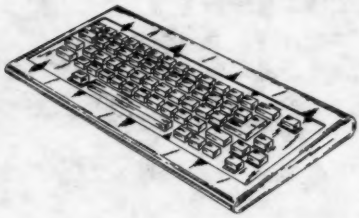
KEYBOARD FOR A PERSONAL COMPUTER

Thomas A. Anzelone, Fort Lauderdale; Myron F. Davis, and Willis Y. Jordan, III, both of Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1983, Ser. No. 532,644

Term of patent 14 years

U.S. Cl. D14—100



287,973

SERIAL PRINTER

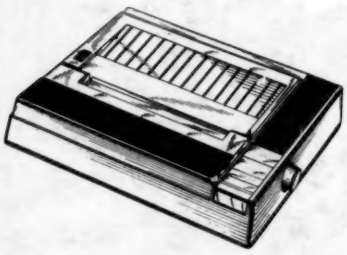
Shigemasa Kato, Zama, and Sanae Takada, Chofu, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,805

Claims priority, application Japan, Mar. 26, 1984, 59-11689

Term of patent 14 years

U.S. Cl. D14—111



287,974

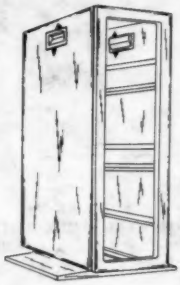
FLOOR STANDING ENCLOSURE FOR PERSONAL COMPUTER

Myron F. Davis; Fred E. Goetz; James C. Harris, all of Boca Raton; Steven E. Howell, Lantana, and David F. O'Connor, Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1984, Ser. No. 619,411

Term of patent 14 years

U.S. Cl. D14—114



287,975

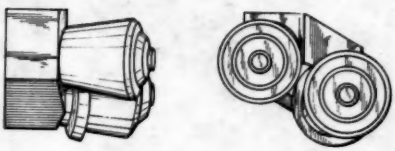
BAND SAW GUIDE

William E. Thompson, Rte. 1, Box 89, Middletown, Ind. 47356

Filed May 24, 1984, Ser. No. 613,430

Term of patent 14 years

U.S. Cl. D15—134



287,976

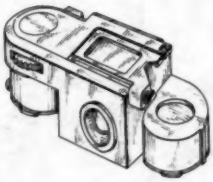
COMBINED CAMERA AND FILM CASSETTE THEREFOR

Hiroshi Nakazawa, Tokyo, Japan, and Kazushi Koida, Hong Kong, Hong Kong, assignors to Seibido Co. Ltd., Tokyo, Japan and Sanyei Corp. Hong Kong Ltd., Hong Kong, Hong Kong

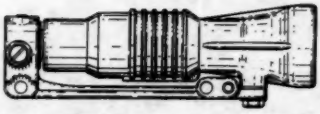
Filed Jun. 17, 1986, Ser. No. 875,743

Term of patent 14 years

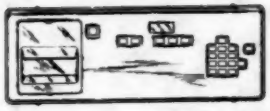
U.S. Cl. D16—1



287,977
SIGHT
Albert W. Cannon, Poole, England, assignor to Focal Point Limited, England
Filed Aug. 3, 1984, Ser. No. 637,416
Claims priority, application United Kingdom, Feb. 7, 1984, 1017751
Term of patent 14 years
U.S. Cl. D16—132

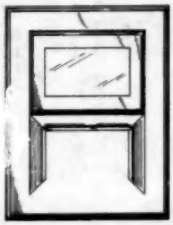


287,978
CALCULATOR
John M. Zatezalo, Pittsburgh, Pa., assignor to Industrial Maintenance Systems, Inc., Pittsburgh, Pa.
Filed Dec. 26, 1984, Ser. No. 686,422
Term of patent 14 years
U.S. Cl. D18—7

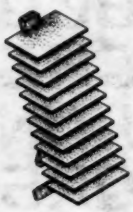


287,979
FONT OF TYPE
Thomas L. Tragesser, P.O. Box 388, Belleville, Ill. 62222
Filed Sep. 24, 1984, Ser. No. 653,576
Term of patent 14 years
U.S. Cl. D18—24

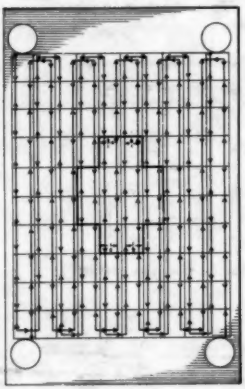
287,980
COMBINED SUPPORT FOR HOLDING AND DISPLAYING CARDS
Larry C. Adams, 103 Sweetbriar, Hernando, Miss. 38632
Filed Feb. 6, 1984, Ser. No. 577,521
Term of patent 14 years
U.S. Cl. D19—86



287,981
COLLATOR
Lawrence J. McNally, 326 Hurricane Rd., Lawrenceville, Ga. 30245
Filed May 7, 1984, Ser. No. 607,464
Term of patent 14 years
U.S. Cl. D19—92

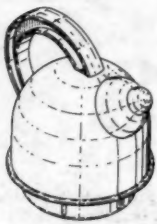


287,982
GAME BOARD OR SIMILAR ARTICLE
Donatus O. Enyi, 2100 19th St., N.W., Washington, D.C. 20009
Filed Jun. 20, 1984, Ser. No. 622,627
Term of patent 14 years
U.S. Cl. D21—34

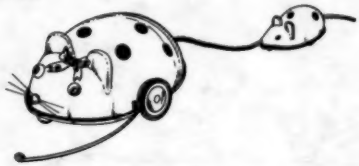


287,983
FLEXIBLE BAND FOR HOLDING GAME PIECES OR THE LIKE
Augusto A. Picozza, Johnston, R.I., assignor to Dart Industries Inc.
Filed Aug. 31, 1984, Ser. No. 646,388
Term of patent 14 years
U.S. Cl. D21—48

287,984
TOY KETTLE
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Great Britain
Filed Dec. 26, 1984, Ser. No. 686,296
Claims priority, application United Kingdom, Sep. 21, 1984, 1022172
Term of patent 14 years
U.S. Cl. D21—122



287,985
MOUSE FIGURES TOY
Johnny K. Lin, Norwalk, Calif., assignor to 3L Plastics USA, Inc., Los Angeles, Calif.
Filed Nov. 26, 1984, Ser. No. 674,943
Term of patent 14 years
U.S. Cl. D21—149

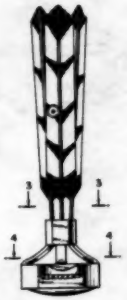


287,986
TOY ROBOT
Tomotoshi Matsui, Tokyo, Japan, assignor to Tomy Kogyo, Inc., Tokyo, Japan
Filed Aug. 2, 1984, Ser. No. 637,170
Claims priority, application Japan, Feb. 7, 1984, 59-3833
Term of patent 14 years
U.S. Cl. D21—150

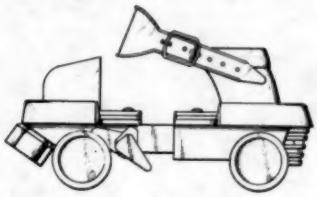
287,987
NOVELTY GOLF BALL FIGURE
George M. Colclasure, 4233 Charter Ave., Oklahoma City, Okla. 73108
Filed Sep. 20, 1985, Ser. No. 778,311
Term of patent 14 years
U.S. Cl. D21—155

287,988
TOY BALL
Andrew J. Billinghurst, Biggin Hill, England, assignor to Hestair Kiddicraft Limited, Great Britain
Filed Mar. 12, 1984, Ser. No. 582,303
Claims priority, application United Kingdom, Jan. 18, 1984, 1017392
Term of patent 14 years
U.S. Cl. D21—204

287,989
SHUTTLECOCK
Eugene Kornhaber, 318 Douglas Rd., Chippaqua, N.Y. 10514, and Ronald Gold, 3400 South Ocean Blvd., Palm Beach, Fla. 33480
Filed Feb. 14, 1984, Ser. No. 580,167
Term of patent 14 years
U.S. Cl. D21—207



287,990
ROLLER SKATE
Reuben B. Klamer, Los Angeles, Calif., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 1, 1983, Ser. No. 547,648
Term of patent 14 years
U.S. Cl. D21—226

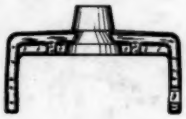


287,991
LURE
Michael G. Lummis, Portage, Mich., assignor to P.T.C., Inc., Kalamazoo, Mich.
Filed Apr. 16, 1984, Ser. No. 600,967
Term of patent 14 years
U.S. Cl. D22—129

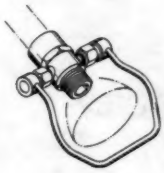
287,992
YOKE FOR A SPRINKLER
William R. McLennan, Easton, Pa., and Robert Rung, Hopatcong, N.J., assignors to Victaulic Company of America, Easton, Pa.
Filed Jun. 12, 1984, Ser. No. 619,859
Term of patent 14 years
U.S. Cl. D23—7

287,993
LIQUID DISPENSER
Herman L. Crow, 8218 Cordelia Cir., Citrus Heights, Calif. 95621
Filed Mar. 24, 1986, Ser. No. 845,752
Term of patent 14 years
U.S. Cl. D23—17

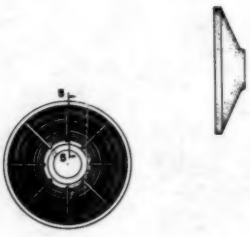
287,994
PAINT CUP YOKE
James E. Jones, deceased, late of Toledo, Ohio (by Amy T. Jones, executor), and Thomas E. Grime, Temperance, Mich., assignors to Champion Spark Plug Company, Toledo, Ohio
Filed Feb. 27, 1984, Ser. No. 584,218
Term of patent 14 years
U.S. Cl. D23—18



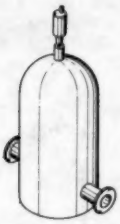
287,995
SHOWER FLOW CONTROLLER
Kenneth F. Ferguson, 16467 Seneca, Victorville, Calif. 92392
Filed Apr. 23, 1984, Ser. No. 602,903
Term of patent 14 years
U.S. Cl. D23—19



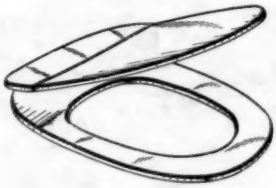
287,996
SPLASH GUARD FOR A FUEL DISPENSING NOZZLE
Mervin L. Carder, Sr., Fenton, Mo., assignor to M. Carder Industries, Inc., St. Louis, Mo.
Filed Sep. 24, 1984, Ser. No. 654,207
Term of patent 14 years
U.S. Cl. D23—36



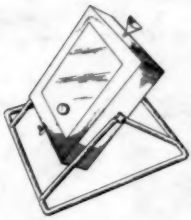
287,997
AIR ELIMINATOR FOR PLUMBING SYSTEMS
Keizo Honma, 6, Nishi 15-chome, Minami 15 Jo, Chuo-ku, Sapporo, Japan
Filed Aug. 1, 1984, Ser. No. 637,502
Claims priority, application Japan, Mar. 3, 1984, 59-8955
Term of patent 14 years
U.S. Cl. D23—46



287,998
COMBINED TOILET SEAT AND COVER, OR SIMILAR ARTICLE
Knud H. Holscher, Virum, Denmark, assignor to Dansk Pressalit A/S, Arhus C, Denmark
Filed May 30, 1984, Ser. No. 615,460
Claims priority, application Denmark, Dec. 21, 1983, 1225/83
Term of patent 14 years
U.S. Cl. D23—71



287,999
PIVOTED VESSEL FOR THE SOLAR HEATING OF WATER
Dennis E. Stowell, Box 796, Parowan, Utah 84761
Filed May 7, 1984, Ser. No. 608,018
Term of patent 14 years
U.S. Cl. D23—72



288,000
OIL STOVE
Kunio Takahashi, Kamo, Japan, assignor to Uchida Manufacturing Co., Ltd., Sanjyo, Japan
Filed Feb. 25, 1983, Ser. No. 469,912
Term of patent 14 years
U.S. Cl. D23—121

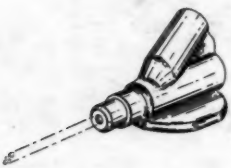
288,001
DEVICE FOR COLLECTING AND REMOVING FIREPLACE ASHES
Chae Y. Chong, 9602 Della Dr., Richmond, Va. 23233
Filed Mar. 27, 1985, Ser. No. 716,464
Term of patent 14 years
U.S. Cl. D23—131

288,002
AIR COOLED REFRIGERATION CONDENSER
Roland A. Ares, St. Charles, and Dennis R. Maechler, St. Louis, both of Mo., assignors to Hussmann Corporation, Bridgeton, Mich.
Filed Oct. 9, 1984, Ser. No. 659,008
The portion of the term of this patent subsequent to Jan. 13, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—139

288,003
HOUSING FOR AIR FRESHENER
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Oct. 25, 1984, Ser. No. 664,676
Term of patent 14 years
U.S. Cl. D23—150

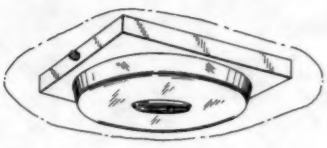
288,004
BREAST PUMP
Donald L. Blachly, Reedsburg, Wis., assignor to Gerber Products Company, Fremont, Mich.
Filed Aug. 29, 1983, Ser. No. 527,587
Term of patent 14 years
U.S. Cl. D24—51

288,005
NEEDLE HUB
Dean M. Glash, McHenry; Robert J. Kruger, Arlington Heights; Steven L. Olson, McHenry, all of Ill., and Richard L. West, Salem, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Apr. 15, 1983, Ser. No. 485,370
The portion of the term of this patent subsequent to Jan. 20, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—61

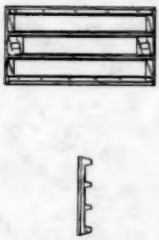


288,006
DISPOSABLE SYRINGE FOR STORING AND ADMINISTERING PHARMACEUTICAL PREPARATIONS
Nils-Gustaf Bergström, Vagnhärad, and Stig B. Lanfelt, Södertälje, both of Sweden, assignors to Astra Lakemedel Aktiebolag, Sweden
Filed Mar. 26, 1984, Ser. No. 593,616
Claims priority, application Sweden, Sep. 26, 1983, 2468/83; Sep. 26, 1983, 2469/83
Term of patent 14 years
U.S. Cl. D24—63

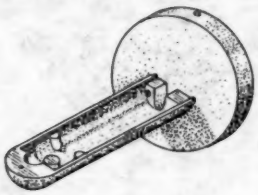
288,007
COMBINATION DEODORIZER AND LIGHT
Kenneth J. Jonas, Hartford, Wis.; Ralph M. Lazar, Skokie, Ill., and David W. Wolbrink, Hartford, Wis., assignors to Broan Mfg. Co., Inc., Hartford, Wis.
Filed Oct. 5, 1983, Ser. No. 539,255
Term of patent 14 years
U.S. Cl. D26—51



288,008
GRILL FOR MOTORCYCLE LIGHT
Gordon E. McMahon, 7400 NW. 31st., Bethany, Okla. 73008
Continuation-in-part of Ser. No. 501,177, Jun. 6, 1983. This application Jul. 30, 1984, Ser. No. 635,849
Term of patent 14 years
U.S. Cl. D26—139

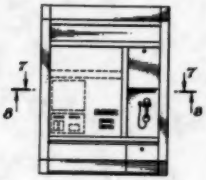


288,009
BRACKET FOR A WALL LAMP OR SIMILAR ARTICLE
Murray C. Pfister, San Francisco, Calif., assignor to Boyd Lighting Company, San Francisco, Calif.
Filed May 16, 1984, Ser. No. 611,025
Term of patent 14 years
U.S. Cl. D26—145

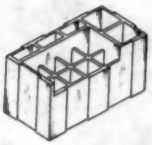


288,010
FIRELESS ASHTRAY
Eulice E. Faulkenberry, 4922 E. Admiral Pl., Tulsa, Okla. 74112
Filed Jan. 28, 1985, Ser. No. 695,275
Term of patent 14 years
U.S. Cl. D27—8

288,011
AUTOMATED TELLER SERVICE CENTER ENCLOSURE
Ernest F. J. Prinzhorn, 1120 Towne Ave., Los Angeles, Calif. 90021
Division of Ser. No. 556,856, Dec. 1, 1983. This application Oct. 11, 1985, Ser. No. 786,618
Term of patent 14 years
U.S. Cl. D99—28

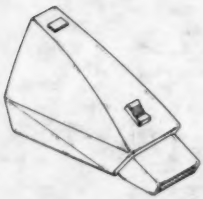


288,012
ORGANIZER FOR LIPSTICKS AND SIMILAR ARTICLES
Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33060
Filed Aug. 20, 1984, Ser. No. 642,348
Term of patent 14 years
U.S. Cl. D28—86

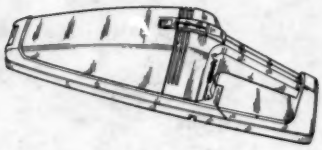


288,013
BIRD FEEDER
Georgiana Schueler, 9 Bengeyfield Dr., East Williston, N.Y. 11596
Filed Feb. 27, 1984, Ser. No. 583,587
Term of patent 14 years
U.S. Cl. D30—13

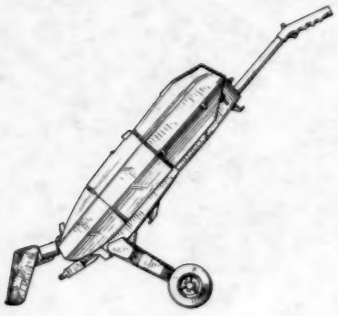
288,014
HAND VACUUM NOZZLE AND HOUSING
Nancy J. Perkins, Schaumberg, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed May 22, 1984, Ser. No. 612,894
Term of patent 14 years
U.S. Cl. D32—18



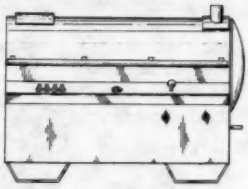
288,015
COMBINED HAND-HELD VACUUM CLEANER, ACCESSORIES AND SUPPORT THEREFOR
Alain Verdier, Sainte Foy Les Lyon, and Marc Polly, Villeurbanne, both of France, assignors to Black & Decker Inc., Newark, Del.
Filed Jun. 19, 1984, Ser. No. 622,114
Claims priority, application France, Dec. 21, 1983, 834799
Term of patent 14 years
U.S. Cl. D32—18



288,016
CARPET CLEANER
Donald E. Watkins, Parma, Ohio, and Frank P. Asdahl, Bound Brook, N.J., assignors to The Regina Co., Inc., Rahway, N.J.
Filed Mar. 2, 1984, Ser. No. 585,719
The portion of the term of this patent subsequent to Jan. 20, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—22

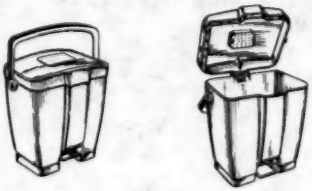


288,017
GAS FIRED HOT WATER PRESSURE CLEANING APPARATUS
Paul W. Linton, 2722 SE. Evans, Troutdale, Oreg. 97060
Filed Aug. 8, 1984, Ser. No. 638,951
Term of patent 14 years
U.S. Cl. D32—25



288,018
CASE FOR A COMPACT DISC SURFACE CLEANING DEVICE AND COMPACT DISC CLEANING SUPPORT
Hirokazu Kawabe, Tokyo, Japan, assignor to Kabushiki Kaisha Nagaoka, Japan
Filed Apr. 27, 1984, Ser. No. 604,535
Claims priority, application Japan, Feb. 1, 1984, 59-3478
Term of patent 14 years
U.S. Cl. D32—35

288,019
DIAPER PAIL
Albert W. Gebhard, Denver; William G. Au, Broomfield, and Robert M. Parker, Aurora, all of Colo., assignors to Gerico, Inc., Denver, Colo.
Filed Dec. 3, 1984, Ser. No. 677,360
Term of patent 14 years
U.S. Cl. D32—37



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PATENTS WERE ISSUED ON THE 27TH DAY OF JANUARY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.A.R.C. (Management) Pty. Limited: *See—*
Flecknoe-Brown, Anthony E., 4,639,165, Cl. 405-45.000.

A. E. Staley Manufacturing Company: *See—*
Valenty, Vivian B.; Hill, William H.; and Ravi, Prasad S., 4,639,325, Cl. 252-89.100.

A. T. Newell Co. Inc.: *See—*
Newell, Alfred T., III; and Nichols, E. Lane, 4,638,850, Cl. 165-26.000.

AB Electrolux: *See—*
Lindstrom, Fred B., 4,638,775, Cl. 123-185.00G.

AB Trama: *See—*
Lohman, Oskar E., 4,638,890, Cl. 188-24.170.

AB Volvo: *See—*
Kronogard, Sven O., deceased; Linden, Allen, administrator; Kronogard, Clas O.; and Kronogard, Hakan, 4,638,637, Cl. 60-718.000.

Abadie, Carole R. Fish attracting device. 4,638,588, Cl. 43-44.990.

Abbott-Interfast Corporation: *See—*
DeHaitre, Lon, 4,639,566, Cl. 200-158.000.

Abbott Laboratories: *See—*
Wong, Sie-Ting, 4,639,424, Cl. 436-74.000.

Abe, Hiroki: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.

Abe, Hiroyuki: *See—*
Fushiya, Fusao; Hakamata, Nobuo; Abe, Hiroyuki; and Inoue, Nobuhiro, 4,638,700, Cl. 83-467.00R.

Abe, Shinya: *See—*
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.

Abraham, Joseph N.; and Scipione, Donald S. Quantity checking system and method. 4,639,875, Cl. 364-479.000.

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Ueno, Atsushi; and Abumi, Takao, 4,639,768, Cl. 358-22.000.

Ache, Lani G.: *See—*
Rung, Robert; and Ache, Lani G., 4,639,020, Cl. 285-367.000.

Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., to Ford Motor Company. Method of [illegible] thin-walled ductile iron castings. 4,638,846, Cl. 164-55.100.

Acme United Corporation: *See—*
Merrill, Richard E.; and Allard, Craig L., 4,638,797, Cl. 128-156.000.

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Adams, D. Carlos. Countercurrent heat transfer device for solid particle streams. 4,639,217, Cl. 432-107.000.

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Adelman, Arnold: *See—*
Hogan, Thomas C.; and Adelman, Arnold, 4,639,936, Cl. 375-36.000.

Adenauer, Ernst: *See—*
Balduin, Franz; and Adenauer, Ernst, 4,638,876, Cl. 177-139.000.

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Advanced Cardiovascular Systems, Inc.: *See—*
Powell, Philip E., 4,638,805, Cl. 128-344.000.

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Murphy, Colin N.; and Lu, Guey T., 4,639,899, Cl. 365-230.000.
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Slee, Roger H., 4,638,694, Cl. 82-18.000.

Aerazur-Efa: *See—*
Rousseau, Jacques R., 4,638,961, Cl. 244-142.000.

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Hawley, Frank D.; and Rogers, Russell L., 4,638,842, Cl. 141-302.000.
Rogers, Russell L.; Perrine, Neill D.; and Alexander, Richard M., 4,639,016, Cl. 285-15.000.

Ageishi, Kazunobu: *See—*
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Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.

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Makishima, Akio; and Tani, Toshiro, 4,639,329, Cl. 252-501.100.

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Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.
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Uytterhoeven, Herman J.; De Winter, Walter F.; and Mar[illegible] August M., 4,639,404, Cl. 430-115.000.

Ahmed, Bashir M.: *See—*
Schellenberg, Lutz; Hamacher, Matthias; and Ahmed, Bashir M., 4,639,319, Cl. 210-651.000.

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Hess, Jack H., 4,638,519, Cl. 5-455.000.

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Tamura, Toru; Shibata, Noriyoshi; and Kawakami, Toshiro, 4,639,148, Cl. 384-420.000.
Watanabe, Tetsumi; Yamaguro, Akira; and Yamaguchi, Susumu, 4,639,212, Cl. 431-183.000.

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Akahori, Masaaki: *See—*
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.

Akamatsu, Keisuke: *See—*
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

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Schopper, Bernd; and Tandler, Peter, 4,639,048, Cl. 303-22.00R.

Allard, Craig L.: *See—*
Merrill, Richard E.; and Allard, Craig L., 4,638,797, Cl. 128-156.000.

Allen, Joseph C.: *See—*
Tanner, Harley L., III; and Allen, Joseph C., 4,639,596, Cl. 250-259.000.

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Clarke, John B.; and Firth, John F., 4,639,395, Cl. 428-341.000.

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Acoraci, Joseph H.; and Moeller, Alvin W., 4,639,732, Cl. 342-371.000.
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Knapp, Anthony W.; and Werth, Dee A., 4,639,064, Cl. 339-89.00M.
Mikolaicyk, John H.; and Krantz, Leonard A., Jr., 4,639,076, Cl. 350-96.200.
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Trinh, Lahn T.; and Lewis, Thomas E., 4,638,780, Cl. 123-416.000.

Allison, Mark D.: *See*—
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.

Allmanna Brandreskapsaffaren AB: *See*—
Ribrant, Sven, 4,638,531, Cl. 24-274.00R.

Allsop, Jon I.: *See*—
Stern, Donald J.; and Allsop, Jon I., 4,639,156, Cl. 401-146.000.

Alps Electric Co., Ltd.: *See*—
Fuke, Takamichi, 4,638,677, Cl. 74-84.00R.
Iigima, Kouta, 4,639,691, Cl. 331-99.000.
Iwata, Tetsuya, 4,639,809, Cl. 360-121.000.
Okita, Masao; and Miyata, Hiroyasu, 4,639,595, Cl. 250-231.0SE.

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Pham, Van Doan, 4,639,565, Cl. 200-148.00A.

Amaniera, John A.: *See*—
Hanson, Harvey E.; and Amaniera, John A., 4,638,603, Cl. 51-219.00R.

Amasek, Inc.: *See*—
Stewart, E. Allen, III; and Keesling, Evan L., 4,638,621, Cl. 56-9.000.

Amchem Products, Inc.: *See*—
Miyamoto, Satoshi; and Nagatani, Masamichi, 4,639,295, Cl. 204-38.100.

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Arotin, Robert L.; Walworth, Bryant L.; and Marini, Michele E., 4,639,268, Cl. 71-105.000.
O'Toole, Michael P.; and Card, Roger J., 4,639,356, Cl. 423-266.000.

American Insulation & Engineering Co., Inc.: *See*—
Amos, James, 4,639,034, Cl. 296-100.000.

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American Standard Inc.: *See*—
Harrell, David P., 4,639,192, Cl. 416-27.000.

Amerock Corporation: *See*—
DeBruyn, William, 4,639,051, Cl. 312-275.000.

Ametek, Inc.: *See*—
McCall, Floyd, 4,638,672, Cl. 73-861.520.

Amjad, Zahid: *See*—
Masler, William F., III; and Amjad, Zahid, 4,639,490, Cl. 524-765.000.

Ammermann, Eberhard: *See*—
Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,639,447, Cl. 514-222.000.

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AMP Incorporated: *See*—
Mueller, Arthur L., 4,639,063, Cl. 339-75.00M.

Amrath, Hans, to TRW Ehrenreich GmbH & Co. KG. Device for attaching bellows to a cylindrical member. 4,639,159, Cl. 403-50.000.

Analog Devices, Incorporated: *See*—
Counts, Lewis W.; and Close, JoAnn P., 4,639,683, Cl. 330-253.000.

Anderson, Carl P., to Ricoh Company, Ltd.; and Ricoh Systems, Inc. Automatic platen document stop for electrophotographic copying apparatus having an automatic feed arrangement. 4,639,128, Cl. 355-75.000.

Anderson, Kenneth E.: *See*—
Salestrom, Charles B.; and Anderson, Kenneth E., 4,639,841, Cl. 362-227.000.

Anderson, Robert L.; Pilarski, James A.; and Klintz, Jerry A., to Applied Microbotics Corporation. Method and apparatus for performing work in a three dimensional space. 4,639,653, Cl. 318-599.000.

Anderson, Sharon K. Security system. 4,638,764, Cl. 119-96.000.

Anderson, Thomas E.: *See*—
Howell, Edward K.; and Anderson, Thomas E., 4,639,933, Cl. 375-8.000.

Andersson, Ralf G., to Gullfiber AB. Tubular filter primarily intended for filtration of liquids. 4,639,318, Cl. 210-491.000.

Ando, Masatoshi; Mochizuki, Hiromine; and Saito, Kazuta, to Kanzaki Paper Manufacturing Co., Ltd. Method for preparing a coating composition for use to produce heat-sensitive record material. 4,639,270, Cl. 106-21.000.

Andresen, Herman J. Contactless controllers sensing displacement along two orthogonal directions by the overlap of a magnet and saturable cores. 4,639,667, Cl. 324-208.000.

Andrew, Kenneth F.: *See*—
Hirayama, Chikara; and Andrew, Kenneth F., 4,639,639, Cl. 313-639.000.

Anelva Corporation: *See*—
Shiokawa, Yoshiro, 4,639,597, Cl. 250-305.000.

Angel, Anthony L.: *See*—
Roberts, Donald L.; Angel, Anthony L.; Clark, Douglas C.; Clearman, Jack F.; and Sink, T. Stephen, 4,638,820, Cl. 131-336.000.

Animal Healthcare Products: *See*—
Dudley, Ralph S., 4,639,246, Cl. 604-158.000.

Antonio Puig, S.A.: *See*—
Marzabal Martinez, Carlos, 4,638,918, Cl. 215-295.000.

Aoi, Kazuo, to Yamaha Hatsudoki Kabushiki Kaisha. Valve actuating mechanism for internal combustion engine. 4,638,774, Cl. 123-90.220.

Aoki, Yoshio; and Tsukamura, Yoshihiro, to Sony Corporation. Magneto-optical apparatus. 4,639,907, Cl. 369-45.000.

Aono, Koji; Saito, Toshinori; and Okada, Chiharu, to Central Glass Company, Limited. Process of preparing disilane by reduction of hexachlorodisilane. 4,639,361, Cl. 423-347.000.

Aono, Toshiaki; and Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Heat-developable light-sensitive material used in silver salt transfers. 4,639,407, Cl. 430-203.000.

Aono, Yasuhiro, to Nippon Kogaku K. K. Gradient index lens system. 4,639,094, Cl. 350-413.000.

Aoyama, Kazuho: *See*—
Hara, Hajime; Orii, Shingo; Aoyama, Kazuho; and Enomoto, Masami, 4,639,503, Cl. 528-92.000.

Aoyama, Keishi: *See*—
Kamei, Noboru; Ikeda, Kinjiro; Aoyama, Keishi; and Hamano, Seitaro, 4,639,294, Cl. 203-88.000.

Aoyama, Tsutomu; Nakamura, Taizo; Terao, Naoyosi; and Shinonaga, Hirohiko, to Mitutoyo Mfg. Co., Ltd. Microscope. 4,639,098, Cl. 350-514.000.

AP Industries, Inc.: *See*—
De Bruine, Mark; and Spotts, Kenneth, 4,638,965, Cl. 248-59.000.

Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Interface controlling bidirectional data transfer between a synchronous and an asynchronous bus. 4,639,861, Cl. 364-200.000.

Applied Microbotics Corporation: *See*—
Anderson, Robert L.; Pilarski, James A.; and Klintz, Jerry A., 4,639,653, Cl. 318-599.000.

Aprigliano, Louis F., to United States of America, Navy. Nickel oxide, ceramic insulated, high temperature coating. 4,639,399, Cl. 428-623.000.

Araghi, Mehdi N.: *See*—
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.

Arai, Yoshihiro; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording medium with chromiumiron protective layer. 4,639,815, Cl. 360-131.000.

Arakawa, Tatsumi: *See*—
Suematsu, Kazumi; Soutome, Kaoru; and Arakawa, Tatsumi, 4,639,297, Cl. 204-59.00F.

Arc Technologies Systems Ltd.: *See*—
Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, 4,639,928, Cl. 373-93.000.

Archer, David H.; Bauer, Frank I.; and Vidt, Edward J., to Westinghouse Electric Corp. Process for electric power production using a biogas. 4,638,629, Cl. 60-39.050.

Archer, Stephen: *See*—
Denham, Keith; and Archer, Stephen, 4,639,174, Cl. 411-34.000.

Arikawa, Junichi; Chiba, Hiroshi; Miyazaki, Osamu; and Osanai, Masatoshi, to Laurel Bank Machines Co., Ltd. Circulating-type bill depositing and disbursing machine. 4,639,582, Cl. 235-379.000.

Arioka, Hiroyuki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; and Arioka, Hiroyuki, 4,639,389, Cl. 428-141.000.

Aritake, Masanori: *See*—
Sugita, Hiroshi; Iwasa, Tadanobu; Yasukawa, Takemasa; and Aritake, Masanori, 4,638,525, Cl. 15-250.360.

Arlington Automatics Inc.: *See*—
Magee, Robert L., Jr.; and Traweek, Marvin B., IV, 4,638,860, Cl. 166-114.000.

Armond, Joseph A.: *See*—
Littwin, Kenneth M.; Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, 4,639,821, Cl. 361-151.000.

Armour Pharmaceutical Company: *See*—
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., 4,639,509, Cl. 530-307.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,639,510, Cl. 530-307.000.
Orlowski, Ronald C.; and Seyler, Jay K., 4,639,511, Cl. 530-307.000.

Armstrong Patents Co. Ltd.: *See*—
Poyser, John, 4 638,896, Cl. 188-299.000.

Armstrong, Richard J., to Bernard Marks and Company Limited. Gas burner. 4,639,215, Cl. 431-354.000.

Arnaud, Jean P. Astigmatic optical element, its manufacturing process, illuminating apparatus including the same and articles treated by the same. 4,639,100, Cl. 350-611.000.

Arnoldt, Fredrick J.: *See*—
Arnoldt, Peter J.; and Arnoldt, Fredrick J., 4,639,574, Cl. 219-125.100.

Arnoldt, Peter J.; and Arnoldt, Fredrick J., to Ductmate Industries, Inc. Automatic duct welding machine. 4,639,574, Cl. 219-125.100.

Arotin, Robert L.; Walworth, Bryant L.; and Marini, Michele E., to American Cyanamid Company. Nitro- and cyanoguanidines as selective preemergence herbicides and plant defoliants. 4,639,268, Cl. 71-105.000.

Artos Engineering Company: *See*—
Randar, Magnus; and Kroening, Terry R., 4,638,904, Cl. 198-468.200.
Asaeda, Takeaki; Nakamura, Toru; and Yutani, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Power converter device. 4,639,850, Cl. 363-58.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Suematsu, Kazumi; Soutome, Kaoru; and Arakawa, Tatsumi, 4,639,297, Cl. 204-59.00F.
Asahina, Hiroshi: *See*—
Suzuki, Motomu; and Asahina, Hiroshi, 4,639,867, Cl. 364-414.000.
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, to Shin-Etsu Chemical Co., Ltd. Method for the improvement of antistatic performance of synthetic resin shaped articles. 4,639,379, Cl. 427-40.000.
Asai, Tsuyoshi: *See*—
Kodama, Mitsuo; Miyake, Masaya; Nakano, Minoi; Asai, Tsuyoshi; and Hara, Akio, 4,639,352, Cl. 419-15.000.
Asakura, Osamu: *See*—
Uchikata, Yoshio; Nozaki, Mineo; Asakura, Osamu; and Nagashima, Masasumi, 4,639,744, Cl. 346-76.0PH.
Asano, Isao, to Babcock-Hitachi Kabushiki Kaisha. Three o'clock narrow groove welding apparatus. 4,639,575, Cl. 219-136.000.
ASEA Aktiebolag: *See*—
Hassellof, Ake; Lenasson, Carl-Gustaf; and Nordhall, Lennart, 4,638,540, Cl. 29-168.000.
Moritz, Bertil, 4,639,282, Cl. 156-53.000.
Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,639,505, Cl. 528-211.000.
Ask, David T.: *See*—
LaBelle, Gary E.; and Ask, David T., 4,639,412, Cl. 430-523.000.
Askins, William E., to Woodstream Corporation. Animal trap with improved security. 4,638,589, Cl. 43-88.000.
Aso, Koichi: *See*—
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.
Association pour la Recherche et le Developpement des Methodes et Processus Industriels "A.R.M.I.N.E.S." : *See*—
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Marc C. F., 4,639,280, Cl. 148-404.000.
Astec Industries, Inc.: *See*—
Brock, J. Donald; and May, James G., 4,638,747, Cl. 110-264.000.
ASV Stubbe GmbH & Co KG: *See*—
Oleff, Werner; and Pape, Fritz G., 4,639,046, Cl. 301-63.0PW.
AT&T Bell Laboratories: *See*—
Lee, Charles M.; and Murphy, Bernard T., 4,639,615, Cl. 307-269.000.
Murphy, Edmond J., 4,639,074, Cl. 350-96.150.
Winters, Jack H., 4,639,914, Cl. 370-110.100.
AT&T Information Systems: *See*—
Rucci, Norman M.; and Sautter, Helmuth O., 4,639,781, Cl. 358-163.000.
AT&T Technologies, Inc.: *See*—
Kim, Myung K.; and Viriyayuthakorn, Montri, 4,638,762, Cl. 118-725.000.
McGonigal, Charles, 4,638,559, Cl. 29-874.000.
Atlantic Richfield Company: *See*—
Wilson, Robert, 4,638,863, Cl. 166-248.000.
Wolcott, Herbert A., II, 4,638,833, Cl. 137-312.000.
Atochem: *See*—
Pasquet, Veronique; and Spitz, Roger, 4,639,430, Cl. 502-120.000.
Atwood, Robert W., to Mattel, Inc. Toy play set with puppet for toy action figures. 4,639,234, Cl. 446-327.000.
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, to Agence National de Valorisation de la Recherche. Conjugates of haptenes and muramylpeptides, endowed with immunogenic activity and compositions containing them. 4,639,512, Cl. 530-313.000.
Auten & Auten, Inc.: *See*—
Auten, Howard L., 4,638,968, Cl. 248-97.000.
Auten, Howard L., to Auten & Auten, Inc. Rubbish container. 4,638,968, Cl. 248-97.000.
Avdel Limited: *See*—
Denham, Keith; and Archer, Stephen, 4,639,174, Cl. 411-34.000.
Axelrod, Joan C.; and Chibnik, Sheldon, to Mobil Oil Corporation. Cold flow improving additive compound and fuel composition containing same. 4,639,256, Cl. 44-71.000.
B. F. Goodrich Company, The: *See*—
Masler, William F., III; and Amjad, Zahid, 4,639,490, Cl. 524-765.000.
Reynes, Enrique G.; and Leising, John O., 4,639,517, Cl. 544-85.000.
Babcock-Hitachi Kabushiki Kaisha: *See*—
Asano, Isao, 4,639,575, Cl. 219-136.000.
Babior, Bernard M., to New England Medical Center Hospitals, Inc. Stabilization of granulocytes. 4,639,373, Cl. 424-101.000.
Babson, Arthur L. Vessel and procedure for automated assay. 4,639,242, Cl. 494-37.000.
Bacharach, Inc.: *See*—
Tomasovic, Beth A.; and Novack, Robert L., 4,639,306, Cl. 204-432.000.
Bader, Alain: *See*—
Boutterin, Daniel; Bertaux, Jean-Paul; and Bader, Alain, 4,639,916, Cl. 371-16.000.
Bader, Imre; Berecz, Endre; Szina, Gabor; and Horvath, Janos, to Nehezipari Muszaki Egyetem. Apparatus for determination of aluminum oxide content of the cryolite melt in aluminum electrolysis cells. 4,639,304, Cl. 204-413.000.
Baggarly, Brad A.; and Scullion, Christopher K., to Bell & Howell Company. Insertion machine with postage categorization and selective merchandising. 4,639,873, Cl. 364-466.000.
Baier, Manfred, to Boehringer Mannheim GmbH. Heterogeneous immunoassay and reagent therefore. 4,639,425, Cl. 436-518.000.
Bailey, Wallace O., to Ford Motor Company. Motor vehicle fuel tank with unitary fuel reservoir. 4,638,836, Cl. 137-574.000.
Bain, Mitchell B.: *See*—
Gang, Joseph M.; and Bain, Mitchell B., 4,639,921, Cl. 371-53.000.
Baitz, Guenter; and Dobring, Wilfried, to Nixdorf Computer AG. Insert for a money drawer. 4,638,908, Cl. 206-0.800.
Baker, Gary L., to Crankshaft Machine Company. Concise quick release tool holder. 4,638,537, Cl. 29-40.000.
Baker, Michael P.: *See*—
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.
Bakker, Gijsbertus; and Rorije, Gerhardus J., to U.S. Philips Corporation. Color display tube window, skirt and mount for color selection means. 4,639,636, Cl. 313-408.000.
Balduin, Franz; and Adenauer, Ernst, to Balduin, Franz. Weighing apparatus. 4,638,876, Cl. 177-139.000.
Baldwin, Gary; Hallgren, Robert B.; Hornak, Thomas; and Ives, Fred H., to Hewlett-Packard Company. Electronic sampler switch. 4,639,619, Cl. 307-352.000.
Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., to Standard Oil Company, The. Bioresistant water-soluble alkyl substituted acrylamide polymers and enhanced oil recovery method employing same. 4,638,865, Cl. 166-274.000.
Ballard, Gary W.; and Mamot, Robert M., to Carrier Corporation. Adaptive microprocessor control system and method for providing high and low heating modes in a furnace. 4,638,942, Cl. 236-10.000.
Ballard Medical Products: *See*—
Palmer, Darrel, 4,638,539, Cl. 29-157.00R.
Ballheimer, Benny, to Caterpillar Inc. Engine having a multipiece cylinder block. 4,638,769, Cl. 123-41.840.
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., to Ortho Pharmaceutical Corporation. Substituted quinazolinediones. 4,639,518, Cl. 544-285.000.
Banton, Martin E.: *See*—
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., to Research Corporation. Non-invasive liquid level and density gauge for nuclear power reactor pressure vessels. 4,639,349, Cl. 376-254.000.
Barbour, Edward J. Tail gate step. 4,639,032, Cl. 296-62.000.
Barbulla, Winfried P. Water bed mattress. 4,638,518, Cl. 5-452.000.
Bardwick, John, III: *See*—
Rogers, O. David; Bardwick, John, III; and Staten, Kenneth, 4,638,604, Cl. 52-6.000.
Barmag Barmer Maschinenfabrik AG: *See*—
Schippers, Heinz; and Lenk, Erich, 4,638,955, Cl. 242-18.0PW.
Barnes, James M.: *See*—
Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, 4,639,478, Cl. 524-97.000.
Barrat, Christian R.; Busch, Alfred; and Sardelis, Kosmas, to Procter and Gamble Company, The. Liquid detergent compositions containing organo-functional polysiloxanes. 4,639,321, Cl. 252-8.800.
Barrett, Mark D.: *See*—
Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., 4,638,855, Cl. 165-101.000.
Barrineau, Julius P.: *See*—
Barrineau, Wyman L., Sr.; and Barrineau, Julius P., 4,638,828, Cl. 137-62.000.
Barrineau, Wyman L., Sr.; and Barrineau, Julius P. Water temperature actuated drip valve. 4,638,828, Cl. 137-62.000.
Barry, Robert F., to Westinghouse Electric Corp. System for optical monitoring of machine positions. 4,639,591, Cl. 250-221.000.
Bartlett, David W., to E M X International Limited. Inductive loop detector. 4,639,689, Cl. 331-65.000.
Bartlett, Joel F.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.
Bartlett, Lawrence D., to Johnson, Robert T., a part interest. Rectal hemorrhoid therapeutic apparatus. 4,638,806, Cl. 128-400.000.
BASF Aktiengesellschaft: *See*—
Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,639,447, Cl. 514-222.000.
Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, 4,639,488, Cl. 524-456.000.
BASF Corporation: *See*—
Finnan, Jeffrey L., 4,639,533, Cl. 549-411.000.
Basile, Philip C., to RCA Corporation. Solid state RF switch with self-latching capability. 4,639,614, Cl. 307-243.000.
Basinsky, Michael J.; Bird, Dale T.; and Smith, Daniel W., to Dowell Schlumberger Incorporated. Machinery skid. 4,638,971, Cl. 248-678.000.
Basler Electric Company: *See*—
Frierdich, Waldo J., 4,639,657, Cl. 322-59.000.

Bass, John C.; and Elsner, Norbert B., to GA Technologies Inc. Modular thermoelectric conversion system. 4,639,542, Cl. 136-210.000.

Basseen, Sanjiv K.; and Harlan, Richard A. Air dryer for pneumatic systems. 4,638,852, Cl. 165-47.000.

Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, to Societe Nationale Elf Aquitaine. Catalyst for the metathesis of olefins. 4,639,429, Cl. 502-117.000.

Bassett, Alton H.: *See*—
Dyer, John; Kennette, John W.; Bassett, Alton H.; and Hall, Stanley D., 4,639,253, Cl. 604-362.000.

Bates, Thomas O.: *See*—
Shoemaker, Lewis E.; and Bates, Thomas O., 4,639,576, Cl. 219-146.230.

Batts, Inc.: *See*—
Blanchard, Russell O., 4,638,930, Cl. 223-85.000.

Bauch, Helmut; and Rehm, Hans, to Siemens Aktiengesellschaft. Broad band coupling switch arrangement with gated power supply. 4,639,613, Cl. 307-241.000.

Bauer, Frank I.: *See*—
Archer, David H.; Bauer, Frank I.; and Vidt, Edward J., 4,638,629, Cl. 60-39.050.

Bauer, Klaus: *See*—
Heubach, Gunther; Bauer, Klaus; and Bieringer, Hermann, 4,639,266, Cl. 71-92.000.

Baumann, Marcus; and Breitenstein, Werner, to Ciba-Geigy Corporation. Process for the preparation of dimethylmaleic anhydride. 4,639,531, Cl. 549-261.000.

Baumers, Hans; Lietzke, Heinz; and Schulte, Winfred, to Losenhausen Maschinenbau AG & Co. Kommanditgesellschaft. Steering axle arrangement for a wheel body of a vehicle. 4,638,877, Cl. 180-21.000.

Baumgardner, Terry A.; Krouse, Jere L.; and Wild, Alan G., to Robbins & Myers, Inc. Sealing apparatus for a gear ball joint. 4,639,200, Cl. 418-48.000.

Baxter Travenol Laboratories, Inc.: *See*—
Mittleman, Herbert, 4,639,019, Cl. 285-332.000.

Bayer Aktiengesellschaft: *See*—
Alewelt, Wolfgang; Eisermann, Wolfgang; Meyer, Karl-Heinrich; Tresper, Erhard; and Ullrich, Martin, 4,639,507, Cl. 528-388.000.
Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, 4,639,478, Cl. 524-97.000.
Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, 4,639,499, Cl. 526-285.000.
Junge, Bodo; Krause, Hans P.; Muller, Lutz; and Puls, Walter, 4,639,436, Cl. 514-24.000.
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.
Lantzsch, Reinhard; and Reubke, Karl-Julius, 4,639,527, Cl. 548-262.000.
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,639,526, Cl. 548-140.000.
Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,639,537, Cl. 558-48.000.
Muller, Hanns P.; Clarenz, Werner; von Gizycki, Ulrich; and Wagner, Kuno, 4,639,502, Cl. 528-45.000.
Richter, Roland; Muller, Hanns P.; and Wegner, Christian, 4,638,795, Cl. 128-90.000.
Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.

BBC Brown, Boveri & Company, Limited: *See*—
Dahler, Peter; Neidhart, Peter; Sadek, Kadry; and Stemmler, Herbert, 4,639,846, Cl. 363-39.000.
Dobler, Thomas, 4,639,077, Cl. 350-96.200.
Mastner, Georg, 4,639,662, Cl. 323-343.000.

Beaumont, Chritien J. M., to U.S. Philips Corporation. Nuclear magnetic resonance apparatus. 4,639,672, Cl. 324-318.000.

Beck, Donald; Miller, James W.; Wernau, William C.; and Young, Thomas B., III, to Pfizer Inc. Biopolymer compositions having enhanced filterability. 4,639,322, Cl. 252-8.554.

Beck, James M.; and Rohr, Robert D., to Owens-Illinois, Inc. Closure with snap-type hinge cap. 4,638,916, Cl. 215-235.000.

Beckenbach, Walter; and Rinderle, Heinz, to Telefunken Electronic GmbH. High frequency amplifier circuit. 4,639,686, Cl. 330-307.000.

Becker, Kunibert; Kirchbrucher, Rudiger; and Preuschoff, Michael, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installation. 4,639,169, Cl. 405-291.000.

Becton, Dickinson and Company: *See*—
Eldegheidy, Mourad M., 4,639,316, Cl. 210-416.100.
Rycroft, Alan K., 4,639,250, Cl. 604-201.000.
Sage, Burton H., Jr., 4,639,421, Cl. 435-34.000.

Bedenk, William T.; and Harden, Kendall L., to Procter & Gamble Company, The. Laminated laundry product. 4,638,907, Cl. 206-0.500.

Bedinghaus Business Forms, Inc.: *See*—
Dove, Thomas D., 4,638,569, Cl. 33-562.000.

Beecham Group p.l.c.: *See*—
Curzons, Alan D., 4,639,534, Cl. 549-414.000.

Beele, Gunther, to Kloeckner-Humboldt-Deutz AG. Apparatus and method for maintaining the temperature of molten metal. 4,638,980, Cl. 266-44.000.

Beery, Jack; and Broome, Barry G., to ITT Corporation. Exposure apparatus for printing system. 4,639,127, Cl. 355-35.000.

Behn, Reinhard, to Siemens Aktiengesellschaft. Consolidated winding electrical capacitor and method for the manufacture thereof. 4,639,832, Cl. 361-306.000.

Beiersdorf Aktiengesellschaft: *See*—
Hansen, Werner, 4,639,453, Cl. 514-254.000.

Beisser, Jean-Claude, to Societe Nouvelle Transfix. Method of constructing transformers using a transformer-coil winding wheel. 4,638,554, Cl. 29-605.000.

Beisser, Jean-Claude. Transformer with gapless core on support. 4,639,705, Cl. 336-5.000.

Beitler, Franz: *See*—
Hoppmanns, Rolf D.; Steup, Walter; Wieczorek, Willibald; and Beitler, Franz, 4,639,801, Cl. 360-96.500.

Belanger, Germain: *See*—
Lalancette, Jean-Marc; and Belanger, Germain, 4,639,309, Cl. 208-262.000.

Belanger, Thomas D., Jr., to GTE Communication Systems Corporation. Beam lead bonding apparatus. 4,638,937, Cl. 228-5.500.

Belitz, Fritz: *See*—
Rinn, Juergen; and Belitz, Fritz, 4,639,110, Cl. 354-403.000.

Bell, Albert H., III; and Johnson, Jesse F., to General Motors Corporation. Hybrid gas turbine rotor. 4,639,194, Cl. 416-241.00B.

Bell Communications Research, Inc.: *See*—
Miller, Stewart E., 4,639,922, Cl. 372-19.000.

Bell & Howell Company: *See*—
Baggarly, Brad A.; and Scullion, Christopher K., 4,639,873, Cl. 364-466.000.

Bell, Stanley C.: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., 4,639,518, Cl. 544-285.000.

Bencini, Elena: *See*—
Sacconi, Luigi; Fon , Marco; Bencini, Elena; and Sabarino, Giampiero, 4,639,506, Cl. 528-212.000.

Bennett, Mark A., to Kelley Company, Inc. Dock shelter. 4,638,612, Cl. 52-173.0DS.

Benshoof, Steven C. Method and means for mounting a vehicle seat. 4,638,546, Cl. 29-526.00R.

Benson, David A.; and Dilts, Ray A., to Full Vision, Inc. Tube bender. 4,638,665, Cl. 72-389.000.

Bensussen, Isaac M.; and Tittel, Hans, to Boeing Company, The. Wire stripper with double wedge spring loaded gripper. 4,638,692, Cl. 81-9.410.

Berardo, Giuseppe, to Mario Pinto S.p.A. Self-centering chuck with adjustable and replaceable jaws. 4,639,001, Cl. 279-121.000.

Berecz, Endre: *See*—
Bader, Imre; Berecz, Endre; Szina, Gabor; and Horvath, Janos, 4,639,304, Cl. 204-413.000.

Berger, Erwin; and Grunig, Rudolf, to Hasler AG Bern. Instrument axle for postage meter. 4 639,581, Cl. 235-101.000.

Bergmann, Lutz: *See*—
Neidig, Arno; Leukel, Bernd; and Bergmann, Lutz, 4,639,759, Cl. 357-74.000.

Bergmans, Anthony B., to Gould Electronics B.V. Apparatus for measuring the volume of a measuring gas. 4,638,661, Cl. 73-237.000.

Bergner, Dieter: *See*—
Staab, Rudolf; Bergner, Dieter; and Hannesen, Kurt, 4,639,303, Cl. 204-258.000.

Bergstrom, Christer, to Neste Oy. Compound film containing olefin. 4,639,398, Cl. 428-451.000.

Berkeley Process Control, Inc.: *See*—
Sagues, Paul, 4,639,884, Cl. 364-565.000.

Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, to Societe des Electrodes et Refractaires "Savoie" (SERS). Continuous method of graphitizing long carbon-containing products and a furnace for carrying out the method. 4,639,929, Cl. 373-120.000.

Bernard Marks and Company Limited: *See*—
Armstrong, Richard J., 4,639,215, Cl. 431-354.000.

Bertaux, Jean-Paul: *See*—
Boutterin, Daniel; Bertaux, Jean-Paul; and Bader, Alain, 4,639,916, Cl. 371-16.000.

Best, Lance E.: *See*—
Dunphy, Gerald F.; and Best, Lance E., 4,639,022, Cl. 292-150.000.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,639,428, Cl. 502-115.000.

Betts, William L.: *See*—
Zuranski, Edward S.; Scott, Robert E.; and Betts, William L., 4,639,934, Cl. 375-10.000.

BFGoodrich Company, The: *See*—
Lai, John T.; and Son, Pyong N., 4,639,479, Cl. 524-100.000.

Bicron Electronics Company: *See*—
Shand, J. Richard; and LaChance, Raymond H., 4,639,704, Cl. 335-255.000.

Bieringer, Hermann: *See*—
Heubach, Gunther; Bauer, Klaus; and Bieringer, Hermann, 4,639,266, Cl. 71-92.000.

Big Time, Inc.: *See*—
Chau, Jacky, 4,639,144, Cl. 368-276.000.

Biljanic, Matt: *See*—
Crittenden, William, 4,638,776, Cl. 123-235.000.

Billigmeier, James E.; Groves, James D.; Haugen, Harwick A.; and Pokorny, Richard J., to Minnesota Mining and Manufacturing Company. Soap-thickened reenterable gelled encapsulants. 4,639,483, Cl. 524-296.000.

Bingener, Hans, to Durol Flying Lindauer Ikh Montage GmbH. Procedure for coating and heat insulating of walls and ceilings, etc., and device for carrying out the procedure. 4,638,545, Cl. 29-460.000.

Bini, Anselmo. Process and apparatus for the lifting and carriage of objects placed on tray-like supports. 4,639,030, Cl. 294-64.100.

Biondi, Carlo: *See—*
Frascaroli, Francesco; and Biondi, Carlo, 4,639,049, Cl. 312-195.000.

Birch, Richard J.: *See—*
Fang, Pao-Hsien, 4,639,543, Cl. 136-256.000.

Bird, Dale T.: *See—*
Basinsky, Michael J.; Bird, Dale T.; and Smith, Daniel W., 4,638,971, Cl. 248-678.000.

Bird, Graham J.: *See—*
Farquharson, Graeme J.; Watson, Keith G.; and Bird, Graham J., 4,639,267, Cl. 71-98.000.

Birkley, Adrian N. Carriage apparatus for saw tables. 4,639,005, Cl. 280-43.140.

Birum, Gail H.; Mathis, Thomas C.; and Stolk, Richard D., to Monsanto Company. Polyester compositions containing a phthalimide. 4,639,480, Cl. 524-104.000.

Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, to Institut Francais du Petrole. Apparatus for the liquid phase hydrotreatment of hydrocarbons in the presence of an expanded or ebullated catalyst bed. 4,639,354, Cl. 422-140.000.

Bisera, Jose; Carrington, James H.; and Weil, Max H., to Institute of Critical Care Medicine. Vascular interface. 4,638,811, Cl. 128-673.000.

Bisping, Bernhard; and Bornefeld, Klaus, to Rheinmetall GmbH. Fin stabilized subcaliber shell of large length to diameter ratio. 4,638,738, Cl. 102-516.000.

Bixler, Richard M.: *See—*
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Bjorshol, Kolbjorn. Conveyer apparatus for fishing line having snoods along its length. 4,638,583, Cl. 43-4.000.

Blanchard, Russell O., to Batts, Inc. Hanger leg mounting structure for a support rod. 4,638,930, Cl. 223-85.000.

Blandamura, Manlio, to Finchimica S.R.L. Therapeutic use of cyproterone acetate. 4,639,440, Cl. 514-178.000.

Blaschke, Felix, to Siemens Aktiengesellschaft. Method and apparatus for determining the torque of a torque generator. 4,638,673, Cl. 73-862.170.

Blasius, Udo; and Rodi, Anton, to Heidelberger Druckmaschinen AG. Data transmission system of optto-couplers. 4,639,727, Cl. 340-825.570.

Bletz, Walter, to Ernst Leitz Wetzlar GmbH. Process and circuit arrangement for amplifying an input current. 4,639,134, Cl. 356-223.000.

Bloothoofd, William, to Hercules Incorporated. Capped printing plate making machine. 4,638,758, Cl. 118-412.000.

Blum, David B.: *See—*
Mednick, R. Lawrence; and Blum, David B., 4,639,470, Cl. 518-700.000.

Blumbach, Rainer: *See—*
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.

Board of Regents, The University of Texas System, The: *See—*
Sherry, A. Dean, 4,639,365, Cl. 424-9.000.

BOC Group plc, The: *See—*
Garrett, Michael E., 4,639,340, Cl. 261-36.100.
Marshall, John; and Oakey, John D., 4,638,638, Cl. 62-9.000.
Marshall, John; and Oakey, John D., 4,638,639, Cl. 62-9.000.

Bodenseewerk Geratetechnik GmbH: *See—*
Weber, Berthold; Giesenberg, Peter; and Steimel, Johannes, 4,639,589, Cl. 250-203.00R.

Boehringer Mannheim GmbH: *See—*
Baier, Manfred, 4,639,425, Cl. 436-518.000.

Boeing Company, The: *See—*
Bensussen, Isaac M.; and Tittel, Hans, 4,638,692, Cl. 81-9.410.
Furlong, James J.; and Howe, Dwayne E., 4,639,824, Cl. 361-179.000.
Jensen, Tom M., 4,639,012, Cl. 280-642.000.
Krogh, Steven B.; and Lloyd, Adam J. P., 4,638,791, Cl. 128-1.00A.
Thompson, Douglas, 4,638,566, Cl. 33-534.000.

Bofinger, Klaus: *See—*
Tornare, Jean; Bofinger, Klaus; and Tschopp, Claudio, 4,639,197, Cl. 417-259.000.

Boge GmbH: *See—*
Moser, Bernd, 4,638,670, Cl. 73-658.000.

Bogner, Martin: *See—*
Scheck, Georg; Bogner, Martin; Schmidt, Manfred; and Kowatsch, Ulrich, 4,639,010, Cl. 280-615.000.

Bohman, Carl E.: *See—*
Strosser, Richard P.; Bohman, Carl E.; and Chow, Mark K., 4,639,666, Cl. 324-202.000.

Boisvert, Richard. Pivotable locking bar for patio doors. 4,639,023, Cl. 292-262.000.

Bokmiller, David J., to Sani-Fresh International, Inc. Cleaning wand caddy. 4,638,910, Cl. 206-15.200.

Bokros, Jack C., to Carbomedics, Inc. Percutaneous access device. 4,639,247, Cl. 604-175.000.

Boles, John A.; and Eastman, Jay M., to Optel System Limited. Bar code scanner laser radiation exposure limit control system. 4,639,606, Cl. 250-555.000.

Bolin, Michael L.: *See—*
Zunkel, Gary D.; and Bolin, Michael L., 4,638,859, Cl. 166-51.000.

Bomar Corporation, Inc.: *See—*
Lybecker, Robert W., 4,638,597, Cl. 49-340.000.

Bonacorsi, Robert W., to Phillips Home Products. Trash compactor. 4,638,730, Cl. 100-229.00A.

Bone, Ronald N., to Southwestern Bell Telephone Company. Pair cut apparatus and method of use. 4,639,555, Cl. 379-327.000.

Bonvallet, Duane J., to General Motors Corporation. Variable valve lift/timing mechanism. 4,638,773, Cl. 123-90.160.

Borer, Claude; and Greter, Andreas, to Hoffmann-La Roche Inc. Cuvette. 4,639,135, Cl. 356-246.000.

Borg-Warner Corporation: *See—*
Gary, James R., 4,639,665, Cl. 324-117.00H.

Bornefeld, Klaus: *See—*
Bisping, Bernhard; and Bornefeld, Klaus, 4,638,738, Cl. 102-516.000.

Borow, Henry. Dust separator. 4,639,260, Cl. 55-302.000.

Bosse, Gene P., to Eaton Corporation. High speed redundancy processor. 4,639,915, Cl. 371-10.000.

Boufford, Richard, to Boufford, Richard. Portable front bike pack assembly. 4,638,933, Cl. 224-41.000.

Boughton, Geoffrey J., to International Computers Limited. Data display system. 4,639,723, Cl. 340-799.000.

Boulanger, Henry J., to Texas Instruments Incorporated. Pressure responsive device. 4,638,721, Cl. 92-6.00D.

Bourgery, Guy R.: *See—*
Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased, 4,639,452, Cl. 514-252.000.

Boussaid, Issam S., to Texaco Inc. Recovery of heavy crude oil from shallow formations by in situ combustion. 4,638,864, Cl. 166-251.000.

Boutterin, Daniel; Bertaux, Jean-Paul; and Bader, Alain, to U.S. Philips Corporation. Automatic method and machine for the simultaneous testing of data processing systems. 4,639,916, Cl. 371-16.000.

Bouvot, Jean-Francois; and Leborgne, Jose , to Valeo. Reduced pressure control device for moving a movable member between three positions. 4,638,723, Cl. 92-48.000.

Bowman-Jones, Gordon, to Endless Energy, Inc. Electro mechanical switch having remotely controlled off position. 4,639,612, Cl. 307-132.00E.

Boyd, David T. Theft-resistant automobile side cover. 4,639,027, Cl. 293-128.000.

Brace, George A.: *See—*
Enders, Max L., deceased; and Thiel, Reinhard A., administrator, 4,639,044, Cl. 301-9.0DN.

Brackelmanns, Norbert W.: *See—*
Neilson, John M. S.; and Brackelmanns, Norbert W., 4,639,762, Cl. 357-23.800.

Bradley, Brian D.: *See—*
Young, Lawrence R.; Sexton, Gregory J.; Mullins, Randal L.; and Bradley, Brian D., 4,639,738, Cl. 346-75.000.

Brakus, Bogdan, to Siemens Aktiengesellschaft. Circuit arrangement for controlled power supply devices particularly for autoconverters. 4,639,847, Cl. 363-46.000.

Brandes, Wilhelm: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.

Brandner, Alois, to Siemens Aktiengesellschaft. Device for sensing a recording medium in a line printer. 4,639,607, Cl. 250-561.000.

Brannigan, Michael J.; and Rutledge, David L., to Harris Corporation. Redundant row decoding for programmable devices. 4,639,896, Cl. 365-200.000.

Bras, Johan Chr. M.; and Lankamp, Herman D., to SKF Industrial Trading & Development Company B. V. Seal for a roller bearing. 4,639,149, Cl. 384-477.000.

Brassfield, Brian. Doll having means to convert from one character to another. 4,639,233, Cl. 446-321.000.

Braun, Eugene R., to Eaton Corporation. Clutch control system and clutch assembly using same. 4,638,898, Cl. 192-0.052.

Braun, Jane E.: *See—*
Rahn, Melanie H.; and Braun, Jane E., 4,639,226, Cl. 434-433.000.

Braxton, Benjamin D.; and Spector, George. Emergency generator battery system. 4,639,654, Cl. 320-2.000.

Breddermann, Rudolf: *See—*
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.

Breidegam, Albert C., to Semtronics Corporation. Stretchable grounding strap having redundant conductive sections. 4,639,825, Cl. 361-212.000.

Breitenstein, Werner: *See—*
Baumann, Marcus; and Breitenstein, Werner, 4,639,531, Cl. 549-261.000.

Brews, James A.: *See—*
Dawe, Stephen G.; and Brews, James A., 4,638,874, Cl. 175-321.000.

Briner, Paul H.: *See—*
Wood, Derek A.; and Briner, Paul H., 4,639,334, Cl. 548-952.000.

Bristol-Myers Company: *See—*
Kaplan, Murray A.; and Vyas, Dolatrai M., 4,639,528, Cl. 548-422.000.
Martel, Alain; and Daris, Jean-Paul, 4,639,335, Cl. 540-304.000.

British Gas Corporation: *See—*
Johnson, Alan, 4,639,580, Cl. 219-541.000.

British Nuclear Fuels plc: *See—*
Sperinck, William A.; and Hall-Wilton, Michael J., 4,638,675, Cl. 73-864.340.

British Petroleum Company p.l.c., The: *See—*
Bunch, Graham; and Dawes, Richard G., 4,638,766, Cl. 122-398.000.

Brock, J. Donald; and May, James G., to Astec Industries, Inc. Coal-fired asphalt plant. 4,638,747, Cl. 110-264.000.

Brock, James R. Wettable spray box. 4,638,926, Cl. 222-82.000.

Brock, Robert K.: *See—*
Johnson, Phil E.; and Brock, Robert K., 4,638,726, Cl. 92-241.000.

Brockett, William S.: *See—*
Martin, James M.; Brockett, William S.; Selleck, Ronald R.; and Croteau, Michael G., 4,639,138, Cl. 356-350.000.

Brooks, Steve M.; and May, David R., to Thorn EMI Domestic Appliances Limited. Heating apparatus. 4,639,579, Cl. 219-464.000.

Broome, Barry G.: *See—*
Beery, Jack; and Broome, Barry G., 4,639,127, Cl. 355-35.000.

Brother Industries, Ltd.: *See—*
Yasuhiro, Miki, 4,639,880, Cl. 364-519.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, 4,639,151, Cl. 400-53.000.
Yamamoto, Takemi; and Tomida, Yasutaka, 4,639,152, Cl. 400-120.000.

Brown, Boveri & Cie., AG: *See—*
Neidig, Arno; Leukel, Bernd; and Bergmann, Lutz, 4,639,759, Cl. 357-74.000.
Weddigen, Gerd; Huber, Robert; Schmidt, Birgit; and Schneider, Hartmut, 4,639,496, Cl. 525-506.000.

Brown, David O.: *See—*
Pappano, Thomas W.; and Brown, David O., 4,639,719, Cl. 340-652.000.

Brown, Gregory C.; and Gravel, James L., to Rosemount Inc. High sensitivity magnetic actuator. 4,638,830, Cl. 137-83.000.

Brown, Walter J., to Milliken Research Corporation. Video display arrangement. 4,638,969, Cl. 248-122.000.

Brownie Manufacturing Co., Inc.: *See—*
Coy, Jeffrey A., 4,638,888, Cl. 187-19.000.

Brunea, Robert W.; and Raby, James M., to Moore Business Forms, Inc. Chromogenic mixtures. 4,639,271, Cl. 106-21.000.

Brunner, Othmar: *See—*
Wullschleger, Andreas; and Brunner, Othmar, 4,638,627, Cl. 59-80.000.

BSD Medical Corporation: *See—*
Turner, Paul F., 4,638,813, Cl. 128-804.000.

Buchel, Karl H.: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.

Buchholz, Karl-Heinz: *See—*
Potel, Gerd; and Buchholz, Karl-Heinz, 4,638,742, Cl. 105-199.300.

Buchner, Norbert; Lemke, Kuno; and Vogele, Gunter, to Robert Bosch GmbH. Apparatus for volumetric metering and dispensing or liquids. 4,638,925, Cl. 222-21.000.

Buck, Wolfgang: *See—*
Sehring, Richard; Buck, Wolfgang; Prokic-Immel, Ricarda; and Lust, Sigmund, 4,639,438, Cl. 514-129.000.

Budapest Muszaki Egyetem: *See—*
Csak, Bela, 4,638,609, Cl. 52-167.000.

Budd Company: *See—*
Epel, Joseph N., 4,639,387, Cl. 428-113.000.

Buike, James W.; and Eddy, William C., to Allied Corporation. Electro/pneumatic proportional valve. 4,638,837, Cl. 137-627.500.

Buky, Gabriel R.: *See—*
Littwin, Kenneth M.; Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, 4,639,821, Cl. 361-151.000.

Bulow, Roland E., to Mobil Oil Corporation. Rotating multi-path fluid manifold. 4,639,228, Cl. 441-5.000.

Bunch, Graham; and Dawes, Richard G., to British Petroleum Company p.l.c., The. Process for the treatment of boiler condensate. 4,638,766, Cl. 122-398.000.

Bunch, Richard P.: *See—*
Parracho, Rui M.; Smith, Lloyd S.; Bunch, Richard P.; and Gross, Alexander L., 4,638,576, Cl. 36-68.000.

Bungo, Edward M.: *See—*
Sovacool, David K.; Van Slyke, Allan S.; and Bungo, Edward M., 4,638,964, Cl. 248-56.000.

Buniff, Egbert D. N. Telescoping measuring stick with signal means. 4,638,563, Cl. 33-169.00R.

Burandt, Corliss O., to Investment Rarites, Incorporated. Valve actuating apparatus for minimizing the need for lash adjustment. 4,638,772, Cl. 123-90.600.

Burgin, Kermit H. Adjustable speculum with incorporated lighting system. 4,638,792, Cl. 128-6.000.

Burlington Industries, Inc.: *See—*
Sutera, Richard, 4,639,737, Cl. 346-75.000.

Burr, Eldon F.: *See—*
Yarne, Andrew J.; and Burr, Eldon F., 4,638,938, Cl. 228-180.100.

Burroughs Wellcome Co.: *See—*
Findlay, John W. A.; and Coker, Geoffrey G., 4,639,459, Cl. 514-343.000.

Burrows, Philip J. Measuring guide for saw and measuring guide system. 4,638,564, Cl. 33-185.00R.

Busch, Alfred: *See—*
Barrat, Christian R.; Busch, Alfred; and Sardelis, Kosmas, 4,639,321, Cl. 252-8.800.

Buschmann, Gerhard; and Muller, Georg, to Jagenberg Ag. Device for measuring the winding hardness of a strip, especially a strip of paper, wound into a reel. 4,638,657, Cl. 73-78.000.

Bushaw, Kenneth A.; Bustamante, Louis A.; and McCurry, James J., to International Business Machines Corporation. Method for producing duplex copy sets from a duplex original set. 4,639,126, Cl. 355-3.0SH.

Bustamante, Louis A.: *See—*
Bushaw, Kenneth A.; Bustamante, Louis A.; and McCurry, James J., 4,639,126, Cl. 355-3.0SH.

Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, to Jean Walterscheid GmbH. Driveline coupling with safety interlock mechanism. 4,639,163, Cl. 403-322.000.

Buthe, Theo: *See—*
Geisthoff, Hubert; Buthe, Theo; and Mikeska, Felix, 4,639,162, Cl. 403-316.000.

Butka, Kemal. Boat with a swinging mast. 4,638,755, Cl. 114-91.000.

Butler, Myron C.; Hilligoss, William R.; and Hilligoss, Lawrence O., to Communications Technology Corporation. Remote testing system for electrical circuits. 4,639,557, Cl. 379-29.000.

Butterwick, Gilbert N., to RCA Corporation. Intensified charge-coupled image sensor having a charge-coupled device with contact pads on an annular rim thereof. 4,639,590, Cl. 250-213.0VT.

Butts, Robert R.: *See—*
Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., 4,639,586, Cl. 250-201.000.

C.G.R. MeV: *See—*
Meyrand, Gabriel, 4,639,634, Cl. 313-62.000.
Tronc, Dominique, 4,639,641, Cl. 315-5.410.

C&K Components, Inc.: *See—*
Fredrickson, Eric, 4,639,562, Cl. 200-43.080.

C.O.M. Cooperativa Operai Metallurgici S.C.R.L.: *See—*
Frascaroli, Francesco; and Biondi, Carlo, 4,639,049, Cl. 312-195.000.

C-Tec, Inc.: *See—*
Munsey, R. Jack; DeJong, Leroy D.; and Keip, Charles P., 4,639,204, Cl. 425-3.000.

Cadwell, George H., Jr.: *See—*
Pittman, Clarence B.; and Cadwell, George H., Jr., 4,639,261, Cl. 55-502.000.

Caillat, Jean-Luc, to Copeland Corporation. Scroll-type machine with variable wrap thickness. 4,639,201, Cl. 418-55.000.

Cain, Joseph B., III: *See—*
McRae, Daniel D.; and Cain, Joseph B., III, 4,639,937, Cl. 375-40.000.

Caldwell, Stephen P.: *See—*
Hopwood, Francis W.; Caldwell, Stephen P.; and Decker, Martin J., 4,639,688, Cl. 331-10.000.

Campanelli, Michael R.: *See—*
Drake, Donald J.; Hawkins, William G.; and Campanelli, Michael R., 4,639,748, Cl. 346-140.00R.

Campbell, Henry F.: *See—*
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,639,442, Cl. 514-212.000.

Camph, Sven E. Means for transmitting brake force. 4,638,893, Cl. 188-79.5GE.

Cannella, Vincent D., to Energy Conversion Devices, Inc. Displays having pixels with two portions and capacitors. 4,639,087, Cl. 350-332.000.

Canon Kabushiki Kaisha: *See—*
Adachi, Hiroyuki; and Saito, Takashi, 4,639,123, Cl. 355-15.000.
Fuziwara, Yutaka; and Yamamoto, Hiroshi, 4,639,083, Cl. 350-255.000.
Isaka, Kazuo, 4,639,119, Cl. 355-3.0DD.
Ito, Yoshio, 4,639,749, Cl. 346-153.100.
Kato, Masatake, 4,639,095, Cl. 350-427.000.
Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,639,096, Cl. 350-427.000.
Kobayashi, Junji; and Kimura, Takashi, 4,639,797, Cl. 360-71.000.
Kugioka, Michihiro, 4,639,084, Cl. 350-255.000.
Kuroda, Yasuo, 4,639,608, Cl. 250-578.000.
Masaki, Hisaji, 4,639,791, Cl. 358-300.000.
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.
Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 4,639,089, Cl. 350-341.000.
Sakai, Shinji; Kawabata, Takashi; and Harada, Yoshihito, 4,639,108, Cl. 354-289.100.
Sakurada, Nobuaki; Kawamura, Hideaki; and Sasaki, Takashi, 4,639,747, Cl. 346-140.00R.
Seto, Kaoru, 4,639,649, Cl. 318-314.000.
Shinoda, Nobuhiko, 4,639,588, Cl. 250-201.000.
Tomita, Yasuo, 4,639,816, Cl. 360-131.000.
Tsunekawa, Tokuichi, 4,639,924, Cl. 372-33.000.
Uchikata, Yoshio; Nozaki, Mineo; Asakura, Osamu; and Nagashima, Masasumi, 4,639,744, Cl. 346-76.0PH.
Yamamoto, Mitsuru; Watanabe, Kunio; and Shimoda, Junji, 4,639,735, Cl. 346-1.100.
Yamamoto, Mitsuru, 4,639,746, Cl. 346-140.00R.

Canosa, Joseph F. Dishwashing apparatus. 4,638,826, Cl. 134-100.000.

Capasso, Vincent; and Kalck, Charles W., Sr., to Kalck, Charles W., Sr.; and Kalck, Kathy. Fire-sprinkler cut-off device. 4,638,866, Cl. 169-90.000.

Caputo, Anthony; and Culter, Gary P. Toilet hook. 4,638,515, Cl. 4-661.000.

Carbomedics, Inc.: *See*—
Bokros, Jack C., 4,639,247, Cl. 604-175.000.
Card, Roger J.: *See*—
O'Toole, Michael P.; and Card, Roger J., 4,639,356, Cl. 423-266.000.
Carelli, Claude: *See*—
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
Carino, John W.: *See*—
Strange, Thomas F.; and Carino, John W., 4,639,827, Cl. 361-272.000.
Strange, Thomas F.; and Carino, John W., 4,639,828, Cl. 361-272.000.
Carl Freudenberg, Firma: *See*—
Idigkeit, Werner; Kurr, Klaus; and Ticks, Gerd-Heinz, 4,638,983, Cl. 267-140.100.
Sciortino, Giacomo, 4,638,981, Cl. 267-8.00R.
Shoji, Rikuo, 4,639,390, Cl. 428-195.000.
Carli, Fabio, to Farmitalia Carlo Erba S.p.A. Pharmaceutical composition. 4,639,370, Cl. 424-80.000.
Carr, Paul, to Flo-Tork, Inc. Combination of cushion, adjuster and side ports in a single unit rotary actuator. 4,638,717, Cl. 91-26.000.
Carranza, Fermin A., Jr.: *See*—
Newman, Michael G.; and Carranza, Fermin A., Jr., 4,638,823, Cl. 132-91.000.
Carrick, Lee. Applicator for coating suspended cable. 4,638,761, Cl. 118-694.000.
Carrier Corporation: *See*—
Ballard, Gary W.; and Mamot, Robert M., 4,638,942, Cl. 236-10.000.
Schoch, Stephen A.; and Sibley, Howard W., 4,639,594, Cl. 250-227.000.
Carrington, James H.: *See*—
Bisera, Jose; Carrington, James H.; and Weil, Max H., 4,638,811, Cl. 128-673.000.
Casanova, Damien, to Mavilor Systemes S.A. Brush-holder for flat-commutator electromechanical transducer. 4,639,629, Cl. 310-248.000.
Casey, Thomas J., to Thomas Engineering, Inc. Method and apparatus for coating particulate granules. 4,639,383, Cl. 427-213.000.
Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, to Gaz de France. Method of heating any building or room and apparatus for carrying out the said method. 4,638,943, Cl. 237-7.000.
Cassagne, Philippe: *See*—
Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, 4,638,943, Cl. 237-7.000.
Cassidy, Dale A.: *See*—
Lewandowski, Edward F.; Cassidy, Dale A.; and Sommer, Robert G., 4,639,571, Cl. 219-121.0EC.
Caterpillar Inc.: *See*—
Ballheimer, Benny, 4,638,769, Cl. 123-41.840.
Murphy, Michael J.; and Smith, Kent D., 4,638,869, Cl. 172-821.000.
Cauwet, Daniele: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,638,822, Cl. 132-7.000.
Cavalieri, Dominic A. Turbine blade holding device. 4,638,602, Cl. 51-217.00R.
CEAG Licht- und Stromversorgungstechnik GmbH: *See*—
Mayer, Hartwig, 4,639,834, Cl. 361-388.000.
Cecil, Alvin S.: *See*—
McMillan, Thomas A.; Mitchell, Henry W.; and Cecil, Alvin S., 4,639,710, Cl. 338-108.000.
Celamerck GmbH & Co. KG: *See*—
Sehring, Richard; Buck, Wolfgang; Prokic-Immel, Ricarda; and Lust, Sigmund, 4,639,438, Cl. 514-129.000.
Celino, Cecilio, administrator: *See*—
Celino, Martin S., deceased; Celino, Cecilio, administrator; and Larrauri, Antonio, administrator, 4,639,467, Cl. 514-468.000.
Celino, Martin S., deceased; by Celino, Cecilio, administrator; and Larrauri, Antonio, administrator. Antibiotic Crismaicin A and compositions thereof. 4,639,467, Cl. 514-468.000.
Central Glass Company, Limited: *See*—
Aono, Koji; Saito, Toshinori; and Okada, Chiharu, 4,639,361, Cl. 423-347.000.
Central Mine Equipment Company: *See*—
Rassieur, Charles L., 4,638,871, Cl. 173-26.000.
Centro Sperimentale Metallurgico S.p.A.: *See*—
Lubrano, Maurizio, 4,638,654, Cl. 72-201.000.
Chabot, Luc G.: *See*—
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.
Chabrier, Patrick: *See*—
Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, 4,639,929, Cl. 373-120.000.
Chadwick, Curt H.; Shulenberger, Art M.; Taylor, John S.; and Simmons, Richard R., to KLA Instruments Corporation. Automatic focusing system for a microscope. 4,639,587, Cl. 250-201.000.
Chamberlain, Savvas G.: *See*—
Schlig, Eugene S.; and Chamberlain, Savvas G., 4,639,678, Cl. 324-457.000.
Chamness, Leland D.: *See*—
Pastrone, Giovanni; and Chamness, Leland D., 4,639,245, Cl. 604-152.000.
Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., to International Business Machines Corporation. Distributed pattern generator. 4,639,919, Cl. 371-27.000.
Chao, Ting-Tsung, to Echolac Co., Ltd. Dual action luggage latch. 4,638,649, Cl. 70-71.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Wood, George A., 4,638,749, Cl. 112-121.120.
Charron, Rene. Protective outer garment for divers. 4,638,509, Cl. 2-2.10R.
Chase, Charles E., Jr.: *See*—
Yarranton, Arthur; Chase, Charles E., Jr.; and Picquendar, Jean E., 4,639,697, Cl. 333-155.000.
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., to Motorola, Inc. Electrostatically sealed piezoelectric device. 4,639,631, Cl. 310-344.000.
Chatterjee, Madhu S., to General Motors Corporation. Single frequency induction hardening process. 4,639,279, Cl. 148-147.000.
Chau, Jacky, to Big Time, Inc. Novelty wrist watch. 4,639,144, Cl. 368-276.000.
Chawla, Manmohan S.; and Speights, Junius L., to Dresser Industries, Inc. Bullet perforating apparatus, gun assembly and barrel. 4,638,712, Cl. 89-1.150.
Chaya, Hiromi, to Dainippon Screen Seizo Kabushiki Kaisha. Method and device for light emitting intensity control in a graphic display device. 4,639,879, Cl. 364-518.000.
Check, John M.; and Johnson, Myron C., to Ex-Cell-O Corporation. Apparatus and method for finishing fuel injector spray tips using EDM. 4,639,568, Cl. 219-69.00M.
Chedid, Louis: *See*—
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
Cheek, Martin G.: *See*—
Holt, Andrew; Cheek, Martin G.; and Clegg, Ernest N., 4,639,432, Cl. 502-324.000.
Chem Systems, Inc.: *See*—
Mednick, R. Lawrence; and Blum, David B., 4,639,470, Cl. 518-700.000.
Cheng, Wei-Tsang, to Jing Tech, Inc. Printing ribbon spool having an ink reservoir and method of making same. 4,639,153, Cl. 400-202.100.
Cherian, Gabe, to Raychem Corporation. Vent hole assembly. 4,639,818, Cl. 361-106.000.
Cherill, Robert J.: *See*—
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,639,443, Cl. 514-222.000.
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,639,446, Cl. 514-222.000.
Ches, Gregory S.: *See*—
Gloomis, Lawrence A.; and Ches, Gregory S., 4,638,533, Cl. 24-633.000.
Chevron Research Company: *See*—
Goodrich, Judson E., 4,639,307, Cl. 208-44.000.
Rose, Bernard F., 4,639,460, Cl. 514-369.000.
Chi, Keh-Fei C.: *See*—
Chow, Pei-Ming D.; and Chi, Keh-Fei C., 4,639,142, Cl. 356-372.000.
Chiba, Hiroshi: *See*—
Arikawa, Junichi; Chiba, Hiroshi; Miyazaki, Osamu; and Osanai, Masatoshi, 4,639,582, Cl. 235-379.000.
Chibnik, Sheldon: *See*—
Axelrod, Joan C.; and Chibnik, Sheldon, 4,639,256, Cl. 44-71.000.
Chikamori, Sunao: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.
Childress, Don E.: *See*—
Quock, Deborah E. R.; Triplett, Timothy L.; and Childress, Don E., 4,639,312, Cl. 210-101.000.
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, to Texas Instruments Incorporated. Apparatus for testing a plurality of integrated circuits in parallel. 4,639,664, Cl. 324-73.0AT.
Chloride Silent Power Ltd.: *See*—
MacLachlan, Stuart; and O'Neill Bell, Christopher, 4,638,555, Cl. 29-623.100.
Choay, Jean: *See*—
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
Chorvat, Robert J.: *See*—
Desai, Bipinchandra N.; Chorvat, Robert J.; and Rorig, Kurt J., 4,639,524, Cl. 546-229.000.
Chou, Stephen Y., to Massachusetts Institute of Technology. Quantum tunneling cantilever accelerometer. 4,638,669, Cl. 73-517.00R.
Chow, Mark K.: *See*—
Strosser, Richard P.; Bohman, Carl E.; and Chow, Mark K., 4,639,666, Cl. 324-202.000.

Chow, Pei-Ming D.; and Chi, Keh-Fei C., to Rockwell International Corporation. Dimension monitoring technique for semiconductor fabrication. 4,639,142, Cl. 356-372.000.

Chromalloy American Corporation: *See—*
Ainsworth, John H.; and Shepler, Robert E., 4,639,388, Cl. 428-117.000.

Chrysler Motors Corporation: *See—*
Heling, Dennis H., 4,639,038, Cl. 297-341.000.
Kronberger, Leonard J., 4,639,560, Cl. 200-19.00R.

Chu, Richard C., to International Business Machines Corp. Composite heat transfer device with pins having wings alternately oriented for up-down flow. 4,638,858, Cl. 165-185.000.

Chu, Zooey C.: *See—*
Marcus, Konrad H.; and Chu, Zooey C., 4,639,085, Cl. 350-283.000.

Chuang, Rong-Chao. Automatic overflow control apparatus for the pipeline passage. 4,638,835, Cl. 137-519.500.

Ciaudelli, Joseph P., to Revlon, Inc. Higher acyl lower alkyl hydroxystearates useful in cosmetics. 4,639,369, Cl. 424-59.000.

Ciba-Geigy Corporation: *See—*
Baumann, Marcus; and Breitenstein, Werner, 4,639,531, Cl. 549-261.000.
Cseh, Georg; and Lienhard, Paul, 4,639,477, Cl. 524-83.000.
Muller, Horst; Zinke, Horst; and Wehner, Wolfgr ag, 4,639,482, Cl. 524-137.000.
Stahl, Peter H.; and Schmitz, Beat, 4,639,338, Cl. 260-502.50C.

Ciga-Geigy Corporation: *See—*
Topfl, Werner, 4,639,264, Cl. 71-87.000.

Cigolini, Flavio. Orthopaedic safety strap suitable for bicycle pedals. 4,638,685, Cl. 74-594.600.

Circon Corporation: *See—*
Sluyter, Erik; and Wooff, Edward A., Jr., 4,639,772, Cl. 358-98.000.

Citizen Watch Co., Ltd.: *See—*
Nakai, Toshihiko, 4,639,650, Cl. 318-333.000.
Sugimoto, Kenji, 4,638,693, Cl. 82-2.500.

Clarenz, Werner: *See—*
Muller, Hanns P.; Clarenz, Werner; von Gizycki, Ulrich; and Wagner, Kuno, 4,639,502, Cl. 528-45.000.

Clark, Douglas C.: *See—*
Roberts, Donald L.; Angel, Anthony L.; Clark, Douglas C.; Clearman, Jack F.; and Sink, T. Stephen, 4,638,820, Cl. 131-336.000.

Clark, Gary E., to Gilmore, G. W.; and Heywood, R. G., part interest to each. Combination toy and game. 4,638,997, Cl. 273-1.0GD.

Clark, James P.: *See—*
Virnig, Michael J.; and Clark, James P., 4,639,540, Cl. 558-444.000.

Clarke, John B.; and Firth, John F., to Allied Colloids Limited. Prepasted wallcoverings. 4,639,395, Cl. 428-341.000.

Clauss, Julius A.: *See—*
Lemieux, George E.; Lewicki, Reginald T.; and Clauss, Julius A., 4,638,686, Cl. 74-688.000.

Clearman, Jack F.: *See—*
Roberts, Donald L.; Angel, Anthony L.; Clark, Douglas C.; Clearman, Jack F.; and Sink, T. Stephen, 4,638,820, Cl. 131-336.000.

Clegg, Ernest N.: *See—*
Holt, Andrew; Cheek, Martin G.; and Clegg, Ernest N., 4,639,432, Cl. 502-324.000.

Clerc, Jean-Frederic; and Muller, Francis, to Commissariat a l'Energie Atomique. Liquid crystal dichroic display with a high brightness contrast. 4,639,090, Cl. 350-346.000.

Clive-Smith, Martin. Corner mechanism for collapsable container. 4,638,744, Cl. 108-56.100.

Close, JoAnn P.: *See—*
Counts, Lewis W.; and Close, JoAnn P., 4,639,683, Cl. 330-253.000.

Coalequip (Proprietary) Limited: *See—*
Dawe, Stephen G.; and Brews, James A., 4,638,874, Cl. 175-321.000.

Coffman, James H.: *See—*
Gifford, Michael F.; and Coffman, James H., 4,638,825, Cl. 133-8.00R.

Coffman, Samuel L.: *See—*
Granberg, Helge O.; and Coffman, Samuel L., 4,639,760, Cl. 357-75.000.

Coffman Systems, Inc.: *See—*
Gifford, Michael F.; and Coffman, James H., 4,638,825, Cl. 133-8.00R.

Cogswell, Garrett: *See—*
Hou, Kenneth C.; and Cogswell, Garrett, 4,639,513, Cl. 530-387.000.

Cohen, Edward; Weaver, Clarence M., Jr.; and Duschl, Robert A., to RCA Corporation. Method for detecting blemishes near the perimeter of a CCD image. 4,639,775, Cl. 358-106.000.

Cohen, Joseph D., to General Electric Company. Fuel nozzle. 4,638,636, Cl. 60-741.000.

Coker, Geoffrey G.: *See—*
Findlay, John W. A.; and Coker, Geoffrey G., 4,639,459, Cl. 514-343.000.

Cole, Rex W. Method and apparatus for testing the power of a lens. 4,639,133, Cl. 356-125.000.

Cole, Willis S.: *See—*
Lee, James, 4,638,884, Cl. 181-141.000.

Colescott, Robert L.: *See—*
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., 4,639,509, Cl. 530-307.000.

Collinson, Christopher D.; and Ross, Hugh M., to Davy McKee (Poole) Limited. Apparatus for applying liquid for a rolling mill. 4,638,950, Cl. 239-551.000.

Collmann, Wilhelm. Device for the positioning of tires. 4,638,756, Cl. 118-215.000.

Collonia, Harald, to VDO Adolf Schindling AG. Device for regulating the speed of a vehicle, particularly an automotive vehicle, having an electronic regulator. 4,638,879, Cl. 180-179.000.

Combs, Donald W.: *See—*
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., 4,639,518, Cl. 544-285.000.

Comlinear Corporation: *See—*
Saller, Kenneth R.; and Rentel, Kurt R., 4,639,685, Cl. 330-263.000.

Command Automation, Inc.: *See—*
Simjian, Luther G., 4,638,996, Cl. 272-146.000.

Commissariat a l'Energie Atomique: *See—*
Clerc, Jean-Frederic; and Muller, Francis, 4,639,090, Cl. 350-346.000.
Dabat, Robert; and Jamet, Claude, 4,639,178, Cl. 413-26.000.
Lazzari, Jean-Pierre, 4,639,289, Cl. 156-643.000.
Lerat, Bernard, 4,639,140, Cl. 356-376.000.
Richard, Philippe; Papillon, Jean-Charles; Guyot, Alain; and Corbellini, Carlo, 4,638,838, Cl. 138-30.000.

Commonwealth Medical Corporation of America: *See—*
Pollack, Robert L.; and Durst, Lawrence, 4,639,465, Cl. 514-419.000.

Communications Technology Corporation: *See—*
Butler, Myron C.; Hilligoss, William R.; and Hilligoss, Lawrence O., 4,639,557, Cl. 379-29.000.

Compagnie d'Informatique Militaire, Spatiale et Aeronautique: *See—*
Val, Christian; Pinel, Joseph; and Gibod, Yves B., 4,639,826, Cl. 361-272.000.

Compton, Wayne W., to Kidde Consumer Durables, Corporation. Luminaire. 4,639,843, Cl. 362-431.000.

Condito, Vincent A.: *See—*
Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-73.000.

Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, to Arc Technologies Systems Ltd. Disc means for an electrode for use in electric arc furnaces. 4,639,928, Cl. 373-93.000.

Consortium fur elektrochemische Industrie GmbH: *See—*
Staiger, Gerhard; Selmayr, Tassilo; Kinzel, Peter; and Reutter, Anneliese, 4,639,541, Cl. 560-20.000.

Continental Pharma Inc.: *See—*
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Converse Inc.: *See—*
Parracho, Rui M.; Smith, Lloyd S.; Bunch, Richard P.; and Gross, Alexander L., 4,638,576, Cl. 36-68.000.

Conway, Anthony J.; Conway, Peter R.; and Conway, Philip J., to Mentor Corporation. Contraceptive hood. 4,638,790, Cl. 128-138.00R.

Conway, Peter R.: *See—*
Conway, Anthony J.; Conway, Peter R.; and Conway, Philip J., 4,638,790, Cl. 128-138.00R.

Conway, Philip J.: *See—*
Conway, Anthony J.; Conway, Peter R.; and Conway, Philip J., 4,638,790, Cl. 128-138.00R.

Cook, Ronald L., to Texaco Inc. Method for forming ethylene glycol from sodium methoxide. 4,639,296, Cl. 204-59.00R.

Cook, William A. Radio frequency nozzle bar dryer. 4,638,571, Cl. 34-1.000.

Cooper, John H.; and South, William H., to Westinghouse Electric Corp. Protective relay circuit for detecting arcing faults on low-voltage spot networks. 4,639,817, Cl. 361-62.000.

Cope, Charles S.; Kitagawa, Katsunosuke; and Konabe, Kazuo, to Du Pont de Nemours, E. I., and Company. Process for separating surfactants from liquid used in the manufacture of concentrated fluoropolymer dispersions. 4,639,337, Cl. 260-408.000.

Copeland Corporation: *See—*
Caillat, Jean-Luc, 4,639,201, Cl. 418-55.000.

Corbellini, Carlo: *See—*
Richard, Philippe; Papillon, Jean-Charles; Guyot, Alain; and Corbellini, Carlo, 4,638,838, Cl. 138-30.000.

Cordi, Alexis H.: *See—*
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Cornell Research Foundation, Inc.: *See—*
Tang, Chung L.; and Donaldson, William F., 4,639,923, Cl. 372-21.000.

Corning Glass Works: *See—*
Powers, Dale R., 4,639,079, Cl. 350-96.330.

Cornwall, Kenneth R. Firestop fitting for carrier mounted water closets. 4,638,829, Cl. 137-75.000.

Corvi-Mora, Camillo. Method of preparing sobrerol and the pharmaceutical application of the sobrerol thus obtained. 4,639,469, Cl. 514-729.000.

Costain Petrocarbon Limited: *See—*
Duckett, Melvyn; and Limb, David I., 4,639,257, Cl. 55-16.000.

Costello, Carmon R.: *See—*
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.

Cottis, Steve G., to Dart Industries Inc. Production of thermally stabilized aromatic polyesters. 4,639,504, Cl. 528-176.000.

Counts, Lewis W.; and Close, JoAnn P., to Analog Devices, Incorporated. Very low input current JFET amplifier. 4,639,683, Cl. 330-253.000.

Courteheuse, Gerard: *See*—
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,639,354, Cl. 422-140.000.

Cox, Richard H.; Grubbs, Harvey J.; and Haut, Stephen A., to Philip Morris Incorporated. Smoking compositions containing a glycosylamine flavorant additive. 4,638,816, Cl. 131-276.000.

Coy, Jeffrey A., to Brownie Manufacturing Co., Inc. Hydraulic elevator. 4,638,888, Cl. 187-19.000.

Coy, William H., to Precisionform, Inc. Breakaway standard support assembly. 4,638,608, Cl. 52-98.000.

Crankshaft Machine Company: *See*—
Baker, Gary L., 4,638,537, Cl. 29-40.000.

Crepinsek, Alois. Simultaneously operated dead bolt lock and security chain. 4,639,024, Cl. 292-264.000.

Critikon, Inc.: *See*—
Ramsey, Maynard, III; Medero, Richard; and Hood, Rush W., Jr., 4,638,810, Cl. 128-681.000.

Crittenden, William, to Biljanic, Matt. Rotary internal combustion engine. 4,638,776, Cl. 123-235.000.

Croteau, Michael G.: *See*—
Martin, James M.; Brockett, William S.; Selleck, Ronald R.; and Croteau, Michael G., 4,639,138, Cl. 356-350.000.

Crouzet S.p.A.: *See*—
Thepault, Claude, 4,639,059, Cl. 339-17.00F.

Crowe, Wayne D., to Ferranti Subsea Systems, Ltd. Combined power and control signal transmission system. 4,639,714, Cl. 340-310.00R.

Crowley, Harris L., Jr., to Union Carbide Corporation. Unencapsulated chip capacitor. 4,639,836, Cl. 361-433.000.

Csak, Bela, to Budapest Muszaki Egyetem. System for reducing the seismic load of tall buildings. 4,638,609, Cl. 52-167.000.

Cseh, Georg; and Lienhard, Paul, to Ciba-Geigy Corporation. Process for coloring high-molecular organic material, and novel metal complexes of oxime(s) of o-hydroxy benzaldehyde(s) and ketone(s). 4,639,477, Cl. 524-83.000.

CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, 4,639,861, Cl. 364-200.000.

CTS Corporation: *See*—
Kuo, Charles C. Y., 4,639,391, Cl. 428-210.000.

Cucchi, Giovanni; and Cucchi, Pietro, to F.LLI Cucchi S.R.L. Equipment for loading bars to be machined on a device for presenting and feeding said bars to a machine tool. 4,639,180, Cl. 414-224.000.

Cucchi, Pietro: *See*—
Cucchi, Giovanni; and Cucchi, Pietro, 4,639,180, Cl. 414-224.000.

Culkin, Joseph B., to Dorr-Oliver Incorporated. Method and apparatus for electrofiltration. 4,639,300, Cl. 204-182.300.

Culter, Gary P.: *See*—
Caputo, Anthony; and Culter, Gary P., 4,638,515, Cl. 4-661.000.

Cuno Inc.: *See*—
Hou, Kenneth C.; and Cogswell, Garrett, 4,639,513, Cl. 530-387.000.

Curry, Douglas N., to Xerox Corporation. Raster scanner variable-frequency clock circuit. 4,639,789, Cl. 358-285.000.

Curtice, Walter R., to RCA Corporation. Fast ternary (GaInAs) logic gate device. 4,639,752, Cl. 357-16.000.

Curzons, Alan D., to Beecham Group p.l.c. Isolation of pseudomonic acid. 4,639,534, Cl. 549-414.000.

Cusumano, Salvatore J.: *See*—
Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., 4,639,586, Cl. 250-201.000.

Czempik, Klaus; and Stremmel, Gerd, to Lever Brothers Company. Process for the preparation of a powder detergent composition of high bulk density. 4,639,326, Cl. 252-91.000.

D. L. Fried Associates, Inc.: *See*—
Fried, David L., 4,639,774, Cl. 358-105.000.

Dabat, Robert; and Jamet, Claude, to Commissariat a l'Energie Atomique. Machine permitting the remote closure of drums. 4,639,178, Cl. 413-26.000.

Dableh, Joseph H.; and Findlay, Raymond D. Pipe-type cable system with electromagnetic field shaper. 4,639,544, Cl. 174-32.000.

Dahler, Peter; Neidhart, Peter; Sadek, Kadry; and Stemmler, Herbert, to BBC Brown, Boveri & Company, Limited. Method and compensating device for compensating current oscillations. 4,639,846, Cl. 363-39.000.

Dahm, Dennis R.: *See*—
McKay, Robert S.; and Dahm, Dennis R., 4,639,236, Cl. 446-430.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Hanamoto, Keiji; and Takagi, Fumio, 4,639,341, Cl. 264-40.100.

Daicel Chemical Industries, Ltd.: *See*—
Kamei, Noboru; Ikeda, Kinjiro; Aoyama, Keishi; and Hamano, Seitaro, 4,639,294, Cl. 203-88.000.

Daikyo Service Station Development Co. Ltd.: *See*—
Yamamoto, Yoshinori, 4,638,671, Cl. 73-708.000.

Daimler-Benz Aktiengesellschaft: *See*—
Krettenauer, Gustav; and Kiwitz, Heinz, 4,639,008, Cl. 280-405.00R.
Schiessle, Edmund; and Forkel, Werner, 4,638,659, Cl. 73-119.00A.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Mitsuka, Ikuo, 4,639,086, Cl. 350-322.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Chaya, Hiromi, 4,639,879, Cl. 364-518.000.

Daishoku Kako Kabushiki Kaisha: *See*—
Koike, Akira, 4,638,561, Cl. 30-284.000.

Daly, Richard T.; and Trokel, Stephen L., to Lasers for Medicine. Laser ophthalmic surgical system. 4,638,801, Cl. 128-303.100.

Daniele, Joseph J.: *See*—
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.

Dantzig, Jonathan A.: *See*—
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,638,535, Cl. 29-1.300.

Daris, Jean-Paul: *See*—
Martel, Alain; and Daris, Jean-Paul, 4,639,335, Cl. 540-304.000.

Darr, Richard C., to Plastipak Packaging, Inc. In-mold label dispenser for blow molding. 4,639,206, Cl. 425-503.000.

Darr, Richard C.: *See*—
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,639,207, Cl. 425-503.000.

Dart Industries Inc.: *See*—
Cottis, Steve G., 4,639,504, Cl. 528-176.000.

Das, Suryya K.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Non-aqueous dispersions prepared with styrene polymer dispersion stabilizers. 4,639,394, Cl. 428-327.000.

Data Motion, Incorporated: *See*—
Wald, Robert D., 4,638,935, Cl. 226-171.000.

Datawell B.V.: *See*—
Rademakers, Petrus J., 4,639,227, Cl. 441-1.000.

Daubendiek, Richard L.; Dickerson, Robert E.; and Kelly, James E., to Eastman Kodak Company. Radiographic elements exhibing reduced crossover. 4,639,411, Cl. 430-510.000.

Daubresse, Francis, to Thomson-CSF. Device obtained by mounting two semiconductor components within a single housing. 4,639,835, Cl. 361-392.000.

Daum, Ronald E., to General Motors Corporation. Electrical connector for printed circuits. 4,639,057, Cl. 339-17.00F.

Davidow, William H.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Davidson, James H.: *See*—
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., 4,639,280, Cl. 148-404.000.

Davison, Grenville: *See*—
Milne, Alistair R.; and Davison, Grenville, 4,638,713, Cl. 89-14.100.

Davy McKee (Poole) Limited: *See*—
Collinson, Christopher D.; and Ross, Hugh M., 4,638,950, Cl. 239-551.000.

Dawe, Stephen G.; and Brews, James A., to Coalequip (Proprietary) Limited. Drill adaptor. 4,638,874, Cl. 175-321.000.

Dawes, Richard G.: *See*—
Bunch, Graham; and Dawes, Richard G., 4,638,766, Cl. 122-398.000.

Day, Chia P.; Krause, Kenneth W.; Whitcomb, Louis L.; and Horn, Berthold K. P., to GMF Robotics Corporation. Method and system for automatically determining the position and attitude of an object. 4,639,878, Cl. 364-513.000.

Day, Wallace, to GIW Industries, Inc. Method of forming abrasive resistant white cast iron. 4,638,847, Cl. 164-55.100.

De La Hoz, Jorge W. Dental floss device. 4,638,824, Cl. 132-91.000.

Debeneix, Pierre; and Tournere, Marcel J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." . Multiflow turbo jet engine secondary flow adjusting device. 4,638,631, Cl. 60-226.300.

DeBin, Rene F.; and Lambrecht, Emiel Y., to FMC Corporation. Web cutting method and apparatus. 4,638,702, Cl. 83-509.000.

De Brie Perry, Forbes G., to National Research Development Corporation. Continuously-variable-ratio transmission having a single input member. 4,638,687, Cl. 74-691.000.

De Bruine, Mark; and Spotts, Kenneth, to AP Industries, Inc. Universal bracket assembly. 4,638,965, Cl. 248-59.000.

DeBruyn, William, to Amerock Corporation. Turn-out shelf assembly for a cabinet. 4,639,051, Cl. 312-275.000.

Decker, Martin J.: *See*—
Hopwood, Francis W.; Caldwell, Stephen P.; and Decker, Martin J., 4,639,688, Cl. 331-10.000.

Declerco, Marc: *See*—
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,639,284, Cl. 156-213.000.

de Corlieu, Guy: *See*—
Huignard, Jean-Pierre; Malard, Marcel; and de Corlieu, Guy, 4,639,091, Cl. 350-347.00V.

Deeds, Robert G. Multi-unit energy use monitor. 4,639,876, Cl. 364-483.000.

Deem, Brian C.; and Kemp, Jack A., to Allied Corporation. Fan drive mechanism. 4,638,900, Cl. 192-85.0CA.

Deere & Company: *See*—
McKee, Kevin D.; and Formwalt, Charles W., Jr., 4,638,720, Cl. 91-522.000.

DeHainaut, Christopher R.: *See*—
Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., 4,639,586, Cl. 250-201.000.

DeHaitre, Lon, to Abbott-Interfast Corporation. DIP switch assembly having side extending leads. 4,639,566, Cl. 200-158.000.

Deisinger, Franz: *See—*
Lovas, Kurt; and Deisinger, Franz, 4,638,625, Cl. 57-263.000.

Deister Concentrator Company, The: *See—*
Zipperian, Donald E., 4,639,313, Cl. 209-170.000.

DeJong, Leroy D.: *See—*
Munsey, R. Jack; DeJong, Leroy D.; and Keip, Charles P., 4,639,204, Cl. 425-3.000.

Delalande S.A.: *See—*
Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased, 4,639,452, Cl. 514-252.000.

della Valle, Francesco; and Romeo, Aurelio, to Fidia, S.p.A. Kit or device and method for administering gangliosides and derivatives thereof by inhalation and pharmaceutical compositions suitable therefor. 4,639,437, Cl. 514-54.000.

DeLuca, Robert D.: *See—*
Jones, Robin M. F.; DeLuca, Robert D.; and Panzera, Carlino, 4,639,218, Cl. 433-8.000.

Del Vecchio, Robert M.; and Specht, Theodore R., to Westinghouse Electric Corp. Rotating flux transformer. 4,639,610, Cl. 307-83.000.

DeMarco, Joseph. Folding umbrella. 4,638,827, Cl. 135-26.000.

Demarest, Vincent M. Vehicle crash barriers. 4,638,979, Cl. 256-13.100.

De Meirsman, Laurent, to Electronics Corporation of America. Method and apparatus for monitoring flame condition. 4,639,717, Cl. 340-578.000.

Denham, Keith; and Archer, Stephen, to Avdel Limited. Self-plugging blind rivet. 4,639,174, Cl. 411-34.000.

Derouane, Eric G.; and von Ballmoos, Roland, to Mobil Oil Corporation. Crystalline silicophosphoaluminate MCM-5. 4,639,357, Cl. 423-306.000.

Derouane, Eric G.; and von Ballmoos, Roland, to Mobil Oil Corporation. Crystalline silicophosphoaluminate MCM-1. 4,639,358, Cl. 423-306.000.

Desai, Bipinchandra N.; Chorvat, Robert J.; and Rorig, Kurt J., to G. D. Searle & Co. Monobasic disobutamide derivatives. 4,639,524, Cl. 546-229.000.

Despotakis, John A.: *See—*
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Desrosiers, Wilfrid; and Labelle, Gaston. Humane animal trap. 4,638,590, Cl. 43-88.000.

Destefanis, Paolo: *See—*
Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, 4,639,861, Cl. 364-200.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Data mask tone variation in an electronic musical instrument. 4,638,707, Cl. 84-1.190.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Rodloff, Rudiger K.; and Jungbluth, Werner W., 4,639,630, Cl. 310-328.000.
Wulf, Rudolf; and Stager, Wolfgang, 4,638,632, Cl. 60-319.000.

Development Finance Corporation of New Zealand: *See—*
Weatherly, John D., 4,639,708, Cl. 336-200.000.

de Winter, Walter: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.

De Winter, Walter F.: *See—*
Uytterhoeven, Herman J.; De Winter, Walter F.; and Marien, August M., 4,639,404, Cl. 430-115.000.

Dextec Metallurgical Pty. Ltd.: *See—*
Everett, Peter K., 4,639,302, Cl. 204-258.000.

D'Hont, Lodewijk J., to Texas Instruments Incorporated. Synchronization system for overlay of an internal video signal upon an external video signal. 4,639,765, Cl. 358-19.000.

Diamond Oil Well Drilling Company: *See—*
Park, Arthur; and Wilson, Bob T., 4,638,872, Cl. 175-46.000.

Dickerson, Robert E.: *See—*
Daubendiek, Richard L.; Dickerson, Robert E.; and Kelly, James E., 4,639,411, Cl. 430-510.000.

Dickie, Ray A.; and Qaderi, Saiyed B. A., to Ford Motor Company. Conjugated diene functional modified aminoepoxy resins. 4,639,493, Cl. 525-113.000.

Diepers, Heinrich; and Schewe, Herbert, to Siemens Aktiengesellschaft. Combined magnetic write and read head for the vertical magnetization of a corresponding recording medium. 4,639,811, Cl. 360-125.000.

Dierichs, Wolfgang; Gierenz, Gerhard; and Kraus, Gabriella, to Henkel Kommanditgesellschaft auf Aktien. Adhesive stick and a process for its production. 4,639,475, Cl. 523-164.000.

Diesel Kiki Co., Ltd.: *See—*
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.

Digital Equipment Corporation: *See—*
Porcher, Thomas C.; and Robinson, Morgan E., 4,639,891, Cl. 364-900.000.

Dilts, Ray A.: *See—*
Benson, David A.; and Dilts, Ray A., 4,638,665, Cl. 72-389.000.

Dobler, Thomas, to BBC Brown, Boveri & Company Limited. Coupling for a light-conducting fiber. 4,639,077, Cl. 350-96.200.

Dobring, Wilfried: *See—*
Baitz, Guenter; and Dobring, Wilfried, 4,638,908, Cl. 206-0.800.

Dr. Ing. Rudolf Hell GmbH: *See—*
Jung, Eggert; and Klopsch, Siegfried, 4,639,770, Cl. 358-76.000.

Doduco KG Dr. Eugen Durrwachter: *See—*
Normann, Norbert, 4,639,313, Cl. 324-260.000.

Doering, Joachim: *See—*
Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.

Doherty, John A.; Ward, Billy W.; and Shaver, David C., to Micrion Limited Partnership. Focused ion beam processing. 4,639,301, Cl. 204-192.310.

Dohi, Hideyuki: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; and Dohi, Hideyuki, 4,639,833, Cl. 361-315.000.

Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, to Veba Oel Entwicklungs-Gesellschaft. Process for the production of reformer feed and heating oil or diesel oil from coal by liquid-phase hydrogenation and subsequent gas-phase hydrogenation. 4,639,310, Cl. 208-412.000.

Dolansky, Franz; and Steiner, Ewald, to Siemens Aktiengesellschaft. Protective element for distributor strips. 4,639,820, Cl. 361-124.000.

Doluca, Tunc, to Intersil, Inc. Flash analog to digital converter. 4,639,715, Cl. 340-347.0AD.

Domas, Dennis R. Offset nipple. 4,639,017, Cl. 285-38.000.

Donaldson, Timothy P.; and Menown, Hugh, to English Electric Valve Company Limited. Thyratron interrupters. 4,639,643, Cl. 315-344.000.

Donaldson, William F.: *See—*
Tang, Chung L.; and Donaldson, William F., 4,639,923, Cl. 372-21.000.

Donovan, Kyle P., to Milsco Manufacturing Company. Height adjustment mechanism for chair backrest. 4,639,039, Cl. 297-353.000.

Dore, Bernard: *See—*
Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, 4,638,943, Cl. 237-7.000.

Dornier GmbH: *See—*
Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, 4,638,962, Cl. 244-203.000.

Dorr-Oliver Incorporated: *See—*
Culkin, Joseph B., 4,639,300, Cl. 204-182.300.

Doty, Gerald L.: *See—*
Nels, Terry E.; Eldridge, Larry; and Doty, Gerald L., 4,639,392, Cl. 428-283.000.

Dove, Thomas D., to Bedinghaus Business Forms, Inc. Business form design aid. 4,638,569, Cl. 33-562.000.

Dow Chemical Company, The: *See—*
Green, John G.; and Hunt, David G., 4,639,472, Cl. 522-107.000.

Dow Corning Kabushiki Kaisha: *See—*
Aizawa, Koichi; Sewa, Shingo; and Nakahara, Hideki, 4,639,489, Cl. 524-588.000.

Dowbenko, Rostyslaw: *See—*
Das, Suryya K.; and Dowbenko, Rostyslaw, 4,639,394, Cl. 428-327.000.

Dowell Schlumberger Incorporated: *See—*
Basinsky, Michael J.; Bird, Dale T.; and Smith, Daniel W., 4,638,971, Cl. 248-678.000.

Drake, Donald J.; Hawkins, William G.; and Camparelli, Michael R., to Xerox Corporation. Ink jet printhead with integral ink filter. 4,639,748, Cl. 346-140.00R.

Drake, Tom. Extension handles for hedge trimmers. 4,638,562, Cl. 30-296.00R.

Dresser Industries, Inc.: *See—*
Chawla, Manmohan S.; and Speights, Junius L., 4,638,712, Cl. 89-1.150.
Fanner, John C.; and Snyder, Warren E., 4,638,777, Cl. 123-277.000.
Snyder, Warren E., 4,638,783, Cl. 123-527.000.
Vezza, Thomas F., 4,639,474, Cl. 523-141.000.

Dubief, Claude: *See—*
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,638,822, Cl. 132-7.000.

Duckett, Melvyn; and Limb, David I., to Costain Petrocarbon Limited. Recovery of carbon dioxide from gas mixture. 4,639,257, Cl. 55-16.000.

Duckett, Steven W.: *See—*
Purcell, John A.; Puglis, John T.; and Duckett, Steven W., 4,639,638, Cl. 313-534.000.

Ductmate Industries, Inc.: *See—*
Arnoldt, Peter J.; and Arnoldt, Fredrick J., 4,639,574, Cl. 219-125.100.

Dudley, Ralph S., to Animal Healthcare Products. Catheter. 4,639,246, Cl. 604-158.000.

Dufrenne, Gerald, to Unitek Corporation. Weld resistance measuring apparatus for a spot welder. 4,639,569, Cl. 219-109.000.

Dunlap, Richard L.: *See—*
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,639,207, Cl. 425-503.000.

Dunphy, Gerald F.; and Best, Lance E., to Ogden Industries Pty Ltd. Sliding window or door lock. 4,639,022, Cl. 292-150.000.

Du Pont de Nemours, E. I., and Company: *See—*
Cope, Charles S.; Kitagawa, Katsunosuke; and Konabe, Kazuo, 4,639,337, Cl. 260-408.000.
Gajjar, Bharat J., 4,638,648, Cl. 66-193.000.
Hancock, Jack A.; Johnson, Walter D.; and Kennedy, Alan D., 4,639,347, Cl. 264-291.000.
Hesson, David P., 4,639,454, Cl. 514-259.000.

Knight, Alan C.; and Malhotra, Satish C., 4,639,497, Cl. 526-93.000.
Lim, Hyun S., 4,639,205, Cl. 425-200.000.
Luoma, Robert P., II; and Willis, Frank M., 4,639,317, Cl. 210-433.200.
Shapiro, Rafael, 4,639,265, Cl. 71-90.000.
Waggoner, Marion G., 4,639,495, Cl. 525-285.000.

Durol Flying Lindauer Ikh Montage GmbH: *See*—
Bingener, Hans, 4,638,545, Cl. 29-460.000.

Durst, Lawrence: *See*—
Pollack, Robert L.; and Durst, Lawrence, 4,639,465, Cl. 514-419.000.

Duschl, Robert A.: *See*—
Cohen, Edward; Weaver, Clarence M., Jr.; and Duschl, Robert A., 4,639,775, Cl. 358-106.000.

Duwel, Dieter: *See*—
Rosner, Manfred; Loewe, Heinz; Duwel, Dieter; and Kirsch, Reinhard, 4,639,463, Cl. 514-395.000.

Dworsky, Lawrence N.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.

Dyer, John; Kennette, John W.; Bassett, Alton H.; and Hall, Stanley D., to Johnson & Johnson Products, Inc. Nonwoven surgical sponge with X-ray detectable element. 4,639,253, Cl. 604-362.000.

Dynic Corporation: *See*—
Ikeda, Sakio, 4,638,819, Cl. 131-331.000.

E M X International Limited: *See*—
Bartlett, David W., 4,639,689, Cl. 331-65.000.

E. R. Squibb & Sons, Inc.: *See*—
Nakane, Masami, 4,639,461, Cl. 514-382.000.

E-Systems, Inc.: *See*—
Kennett, Scott W., 4,639,938, Cl. 375-60.000.

Eastman, Jay M.: *See*—
Boles, John A.; and Eastman, Jay M., 4,639,606, Cl. 250-555.000.

Eastman Kodak Company: *See*—
Daubendiek, Richard L.; Dickerson, Robert E.; and Kelly, James E., 4,639,411, Cl. 430-510.000.
Fleisher, Richard B.; and Rubin, Bruce A., 4,639,769, Cl. 358-27.000.
Franke, Hans G., 4,639,405, Cl. 430-124.000.
Harvey, Donald M., 4,639,111, Cl. 354-481.000.
Hawkins, Gilbert A., 4,639,277, Cl. 148-33.300.
Ville, Ivan B.; Walling, James D.; and Yousey, Kevin E., 4,638,759, Cl. 118-657.000.
Young, Lawrence R.; Sexton, Gregory J.; Mullins, Randal L.; and Bradley, Brian D., 4,639,738, Cl. 346-75.000.

Eaton Corporation: *See*—
Bosse, Gene P., 4,639,915, Cl. 371-10.000.
Braun, Eugene R., 4,638,898, Cl. 192-0.052.
Myers, Charles M., 4,639,154, Cl. 400-584.000.
Sitabkhan, Mansur N.; and Mack, Raymond E., 4,638,894, Cl. 188-170.000.
Soeters, Raymond A., Jr., 4,638,570, Cl. 33-562.000.
Storm, Eric L., 4,639,869, Cl. 364-424.100.
Torrence, Robert J., 4,638,973, Cl. 251-129.020.
Zumbusch, Steven J., 4,639,203, Cl. 418-61.00B.

Eaton, Homer L., to MTS Vektronics Corporation. Wire processing method and apparatus. 4,638,558, Cl. 29-861.000.

EB Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Grossmann, Stefan; and Nitzsche, Erhard, 4,638,734, Cl. 101-248.000.

Ebara, Katsuya: *See*—
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,638,646, Cl. 62-478.000.

Ebihara, Hiroshi: *See*—
Shimamiya, Yukio; Narumo, Kinzo; and Ebihara, Hiroshi, 4,639,066, Cl. 339-132.00B.

Ebisu, Satoshi: *See*—
Ueno, Katsuji; Nagaoka, Kenji; Miyashita, Akira; and Ebisu, Satoshi, 4,639,344, Cl. 264-83.000.

Echolac Co., Ltd.: *See*—
Chao, Ting-Tsung, 4,638,649, Cl. 70-71.000.

Economic Development Corporation: *See*—
Olson, Donald M., 4,639,028, Cl. 294-34.000.

Eddy, William C.: *See*—
Buike, James W.; and Eddy, William C., 4,638,837, Cl. 137-627.500.

Edholm, Stig; and Stenberg, Bengt. Signal transmitter. 4,639,711, Cl. 338-114.000.

Egami, Hidemi: *See*—
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.

Ehlinger, Edward E.: *See*—
Hung, William M.; and Ehlinger, Edward E., 4,639,750, Cl. 346-221.000.

Eickmann, Karl. Toothbrush capable of multidirectional brushing. 4,638,520, Cl. 15-22.00R.

Einthoven, Willem G., to General Instrument Corporation. Schottky barrier device and method of manufacture. 4,638,551, Cl. 29-571.000.

Eisai Co., Ltd.: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.

Eisermann, Wolfgang: *See*—
Alewelt, Wolfgang; Eisermann, Wolfgang; Meyer, Karl-Heinrich; Tresper, Erhard; and Ullrich, Martin, 4,639,507, Cl. 528-388.000.

Eitan, Boaz, to Wafer Scale Integration, Inc. Self-aligned split gate EPROM. 4,639,893, Cl. 365-185.000.

Eiteljorg, Harrison, II. Ski boot. 4,638,578, Cl. 36-119.000.

Ejiri, Yuuki; Ito, Tomoo; Tsuruta, Hisato; and Kamifuji, Hiroshi, to Hitachi, Ltd. Torque motor having a coil with finite turning range. 4,639,624, Cl. 310-154.000.

Eklund, Vidar: *See*—
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,514, Cl. 536-30.000.
Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,515, Cl. 536-30.000.

Eldegheidy, Mourad M., to Becton, Dickinson and Company. Automatic liquid component separator. 4,639,316, Cl. 210-416.100.

Eldridge, John D., Jr., to Jodel Associates, Inc. Replacement lever. 4,638,681, Cl. 74-544.000.

Eldridge, Larry: *See*—
Nels, Terry E.; Eldridge, Larry; and Doty, Gerald L., 4,639,392, Cl. 428-283.000.

Electro-Matic Products Co.: *See*—
Littwin, Kenneth M.; Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, 4,639,821, Cl. 361-151.000.

Electronics Corporation of America: *See*—
De Meirsman, Laurent, 4,639,717, Cl. 340-578.000.

Elenewski, Allen. Visor defroster. 4,638,728, Cl. 98-2.080.

Elevator GmbH: *See*—
Heikkinen, Urho, 4,638,610, Cl. 52-109.000.

Eli Lilly and Company: *See*—
Hunt, Ann H.; Molloy, R. Michael; Nagarajan, Ramakrishnan; and Schabel, Amelia A., 4,639,433, Cl. 514-8.000.

Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., to Kamyr, Inc. Heat exchange treatment of fluids. 4,638,855, Cl. 165-101.000.

Elsner, Georg; Staendeke, Horst; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for making pulverulent ammonium polyphosphates stable to hydrolysis. 4,639,331, Cl. 252-609.000.

Elsner, Norbert B.: *See*—
Bass, John C.; and Elsner, Norbert B., 4,639,542, Cl. 136-210.000.

Emhart Industries, Inc.: *See*—
Kulikauskas, Joseph A., 4,639,263, Cl. 65-158.000.

EMI Limited: *See*—
Hounsfield, Godfrey N., 4,639,941, Cl. 378-11.000.

Emmert, Manfred. Device for producing mechanical force by pressure of a fluid. 4,638,724, Cl. 92-84.000.

Enders, Max L., deceased; and by Thiel, Reinhard A., administrator, to Sellers, William Douglas; and Brace, George A. Demountable wheel. 4,639,044, Cl. 301-9.0DN.

Endless Energy, Inc.: *See*—
Bowman-Jones, Gordon, 4,639,612, Cl. 307-132.00E.

Endo, Keiji: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; and Dohi, Hideyuki, 4,639,833, Cl. 361-315.000.

Energy Conversion Devices, Inc.: *See*—
Cannella, Vincent D., 4,639,087, Cl. 350-332.000.

English Electric Valve Company Limited: *See*—
Donaldson, Timothy P.; and Menown, Hugh, 4,639,643, Cl. 315-344.000.

Enomoto, Masami: *See*—
Hara, Hajime; Orii, Shingo; Aoyama, Kazuho; and Enomoto, Masami, 4,639,503, Cl. 528-92.000.

Enso-Gutzeit Oy: *See*—
Puumalainen, Pertti, 4,639,942, Cl. 378-045.000.

Epel, Joseph N., to Budd Company. Fibrous armor material. 4,639,387, Cl. 428-113.000.

Era, Akio: *See*—
Matsui, Shingo; Ikeda, Hidetsugu; Era, Akio; and Nishimura, Sanji, 4,639,355, Cl. 423-112.000.

Erickson, Ronald: *See*—
Adams, Robert T.; and Erickson, Ronald, 4,639,584, Cl. 235-449.000.

Ernst Leitz Wetzlar GmbH: *See*—
Bletz, Walter, 4,639,134, Cl. 356-223.000.

Erregierre Industria Chimica Spa: *See*—
Molinari, Egidio, 4,639,449, Cl. 514-234.000.

Erth, Dieter: *See*—
Grenzendoerfer, Dietmar; Wierzgon, Achim; Mueller, Gerhard; Erth, Dieter; Guenther, Ludwig; and Kuenzel, Rolf, 4,638,647, Cl. 66-84.00A.

ETA SA Fabriques d'Ebauches: *See*—
Wullschleger, Andreas; and Brunner, Othmar, 4,638,627, Cl. 59-80.000.

Etablissements Maurice Maillard: *See*—
Monka, Edouard, 4,639,241, Cl. 474-902.000.

Etela Hameen Keuhkovammyhdistys R.Y.: *See*—
Hakkinen, Taisto, 4,638,812, Cl. 128-726.000.

Ethicon, Inc.: *See*—
Jewusiak, Stephen J., 4,638,804, Cl. 128-325.000.

Ethyl Petroleum Additives, Inc.: *See*—
Lam, William Y., 4,639,324, Cl. 252-48.600.

Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, to Sharp Kabushiki Kaisha. Data selection circuit for the screen display of data from a personal computer. 4,639,721, Cl. 340-747.000.

Eue, Ludwig: *See*—
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,639,526, Cl. 548-140.000.
Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,639,537, Cl. 558-48.000.

Eurofours: *See*—
Lancelot, Pierre, 4,638,788, Cl. 126-198.000.

Everett, Peter K., to Dextec Metallurgical Pty. Ltd. Electrolytic cell for recovery of metals from metal bearing materials. 4,639,302, Cl. 204-258.000.

Ex-Cell-O Corporation: *See*—
Check, John M.; and Johnson, Myron C., 4,639,568, Cl. 219-69.00M.

Exxon Research & Engineering Co.: *See*—
Best, Steven A., 4,639,428, Cl. 502-115.000.
Gates, William E.; and Fiato, Rocco A., 4,639,431, Cl. 502-304.000.
Hazelton, Donald R.; and Puydak, Robert C., 4,639,487, Cl. 524-425.000.

F.LLI Cucchi S.R.L.: *See*—
Cucchi, Giovanni; and Cucchi, Pietro, 4,639,180, Cl. 414-224.000.

Fairchild Semiconductor Corporation: *See*—
Krishna, Surinder, 4,639,274, Cl. 148-1.500.

Falk, Frederick A.: *See*—
Makhlouf, Joseph M.; Falk, Frederick A.; and Piccirilli, Robert M., 4,639,492, Cl. 525-54.420.

Falotico, Robert: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., 4,639,518, Cl. 544-285.000.

Fang, Pao-Hsien, to Birch, Richard J., a part interest. Semiconductor devices having a metallic glass substrate. 4,639,543, Cl. 136-256.000.

Fann, Yaw S.; and Wu, Rong-Fea, to Tong Lung Metal Industry Co., Ltd. Adjustable dead bolt assembly. 4,639,025, Cl. 292-337.000.

Fanner, John C.; and Snyder, Warren E., to Dresser Industries, Inc. Prechamber fuel control system. 4,638,777, Cl. 123-277.000.

Fanuc Ltd.: *See*—
Kishi, Hajimu; Matsui, Mitsuo; and Matsuura, Hitoshi, 4,639,172, Cl. 409-80.000.
Takekoshi, Yoshitaka; and Ushiyama, Shigeyuki, 4,639,627, Cl. 310-156.000.

Farmacon Research Corporation: *See*—
Niazi, Sarfaraz; and Shemesh, Alvin, 4,639,368, Cl. 424-48.000.

Farmer, James R., to ISC Technologies, Inc. Bomblet dispersion system for a cluster bomb. 4,638,736, Cl. 102-393.000.

Farmitalia Carlo Erba S.p.A.: *See*—
Carli, Fabio, 4,639,370, Cl. 424-80.000.

Farmos Group, Ltd.: *See*—
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,639,464, Cl. 514-396.000.

Farmwald, Paul M., to United States of America, Energy. Bifurcated method and apparatus for floating point addition with decreased latency time. 4,639,887, Cl. 364-748.000.

Farquharson, Graeme J.; Watson, Keith G.; and Bird, Graham J., to ICI Australia Limited. Herbicidal cyclohexane-1,3-dione derivatives. 4,639,267, Cl. 71-98.000.

Farrar, Frank W. Grip for hand gun. 4,638,582, Cl. 42-71.010.

Feenick, Robert A. Vehicle fuel tank construction. 4,638,919, Cl. 220-288.000.

Fehrenbach, Gustav W.: *See*—
Salour, Michael M.; and Fehrenbach, Gustav W., 4,639,075, Cl. 350-96.160.

Fellows, Constance A.; and Fu, Wallace Y., to Union Carbide Corporation. Intermediate, its synthesis, and its use in a process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran. 4,639,536, Cl. 549-462.000.

Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., to United States of America, Air Force. Optically phased laser transmitter. 4,639,586, Cl. 250-201.000.

Ferens, Jerzy: *See*—
Noworolski, Zbigniew; and Ferens, Jerzy, 4,639,849, Cl. 363-56.000.

Ferlan, Stephen J.: *See*—
Shallenberger, John M.; and Ferlan, Stephen J., 4,638,543, Cl. 29-426.500.
Shallenberger, John M.; and Ferlan, Stephen J., 4,638,556, Cl. 29-723.000.

Fern, Derek T., to PMB Systems Engineering Limited. Construction of jackets. 4,639,166, Cl. 405-203.000.

Ferranti Subsea Systems, Ltd.: *See*—
Crowe, Wayne D., 4,639,714, Cl. 340-310.00R.

Ferrier, Herman, to Fuji Photo Film Co., Ltd. Multiply pulsed magnetic recording. 4,639,794, Cl. 360-46.000.

Fetko, Paul; and Zaglin, Lawrence C. Folding double mirror device. 4,639,102, Cl. 350-626.000.

Fiato, Rocco A.: *See*—
Gates, William E.; and Fiato, Rocco A., 4,639,431, Cl. 502-304.000.

Fiber Controls Corp.: *See*—
Murray, William R., 4,638,875, Cl. 177-1.000.

Fidia, S.p.A.: *See*—
della Valle, Francesco; and Romeo, Aurelio, 4,639,437, Cl. 514-54.000.

Finchimica S.R.L.: *See*—
Blandamura, Manlio, 4,639,440, Cl. 514-178.000.

Findlay, John W. A.; and Coker, Geoffrey G., to Burroughs Wellcome Co. Use of trifluoromethyl compounds. 4,639,459, Cl. 514-343.000.

Findlay, Raymond D.: *See*—
Dableh, Joseph H.; and Findlay, Raymond D., 4,639,544, Cl. 174-32.000.

Finnan, Jeffrey L., to BASF Corporation. Alpha tocopherol process. 4,639,533, Cl. 549-411.000.

Fiquet, Claire: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,638,822, Cl. 132-7.000.

Firestone Tire & Rubber Company, The: *See*—
Yang, James H. C.; and Tomaszewski, Walter, 4,638,532, Cl. 24-462.000.

Firth, John F.: *See*—
Clarke, John B.; and Firth, John F., 4,639,395, Cl. 428-341.000.

Fischetti, David C. Wood I-joist and method of fabricating the same. 4,638,619, Cl. 52-729.000.

Fitzi, Karl: *See*—
Fuchs, Ernst; and Fitzi, Karl, 4,639,315, Cl. 210-333.100.

Fixtures Manufacturing Corporation: *See*—
Lange, Gerd, 4,639,042, Cl. 297-444.000.

Flanders Filters, Inc.: *See*—
Pittman, Clarence B.; and Cadwell, George H., Jr., 4,639,261, Cl. 55-502.000.

Flecknoe-Brown, Anthony E., to A.A.R.C. (Management) Pty. Limited. Drainage tube. 4,639,165, Cl. 405-45.000.

Fleischhauer, Eugene T. Vacuum cleaner attachments. 4,638,527, Cl. 15-371.000.

Fleisher, Richard B.; and Rubin, Bruce A., to Eastman Kodak Company. Modifying color digital images. 4,639,769, Cl. 358-27.000.

Fleissner, Heinz, to Vepa Aktiengesellschaft. Heat treatment tunnel. 4,638,572, Cl. 34-41.000.

Fling, Russell T., to RCA Corporation. Video signal field/frame storage system. 4,639,783, Cl. 358-166.000.

Fling, Russell T., to RCA Corporation. Video signal recursive filter adaptively controlled responsive to the history of image motion. 4,639,784, Cl. 358-167.000.

Fling, Russell T.: *See*—
Willis, Donald H.; and Fling, Russell T., 4,639,763, Cl. 358-11.000.

Flo-Tork, Inc.: *See*—
Carr, Paul, 4,638,717, Cl. 91-26.000.

Floyd, William M.; and Juzswik, David L., to United Technologies Automotive, Inc. Load current management system for automotive vehicles. 4,639,609, Cl. 307-10.00R.

FMC Corporation: *See*—
DeBin, Rene F.; and Lambrecht, Emiel Y., 4,638,702, Cl. 83-509.000.

Foa , Marco: *See*—
Sacconi, Luigi; Foa , Marco; Bencini, Elena; and Sabarino, Giampiero, 4,639,506, Cl. 528-212.000.

Foerster, Karl-Heinz; and Koerner, Siegfried, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Indicating device for a printing machine for superimposing ink key setting values on an image to be printed. 4,639,776, Cl. 358-107.000.

Folienwalzwerk Brueder Teich Akitenesellschaft: *See*—
Prohaska, Helmut, 4,638,911, Cl. 206-611.000.

Ford Aerospace & Communications Corporation: *See*—
Jolitz, William L.; and Williams, Richard A., 4,639,385, Cl. 427-386.000.

Ford, James H., to Robroy Industries. Support member for hanging cable. 4,638,966, Cl. 248-62.000.

Ford Motor Company: *See*—
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,638,846, Cl. 164-55.100.
Bailey, Wallace O., 4,638,836, Cl. 137-574.000.
Dickie, Ray A.; and Qaderi, Saiyed B. A., 4,639,493, Cl. 525-113.000.
Habermann, Heinz P., 4,639,150, Cl. 384-536.000.
Lemieux, George E.; Lewicki, Reginald T.; and Clauss, Julius A., 4,638,686, Cl. 74-688.000.
Tannenlaufer, Gerd, 4,638,679, Cl. 74-501.00R.

Ford, Thomas E. Container for retaining paint. 4,638,909, Cl. 206-1.700.

Forest Engineering Research Institute of Canada: *See*—
Mellgren, Per-Gustaf, 4,639,186, Cl. 414-734.000.

Forkel, Werner: *See*—
Schiessle, Edmund; and Forkel, Werner, 4,638,659, Cl. 73-119.00A.

Formwalt, Charles W., Jr.: *See*—
McKee, Kevin D.; and Formwalt, Charles W., Jr., 4,638,720, Cl. 91-522.000.

Forner, Siegfried; Katscher, Erich; and Ring, Stefan, to Kraftwerk Union Aktiengesellschaft. Repair device for a reactor pressure vessel. 4,639,351, Cl. 376-310.000.

Fors, Jan: *See*—
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,514, Cl. 536-30.000.
Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,515, Cl. 536-30.000.

Foster, John B.: *See*—
Kelly, Michael N.; Foster, John B.; and Foster, Robert D., 4,639,252, Cl. 604-282.000.

Foster, Robert D.: *See*—
Kelly, Michael N.; Foster, John B.; and Foster, Robert D., 4,639,252, Cl. 604-282.000.

Foster Wheeler Energy Corporation: *See*—
Skinner, Geoffrey F., 4,638,765, Cl. 122-7.00R.

Fourcadier, Chantal: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,638,822, Cl. 132-7.000.

Fournier, Jean, to Stein Industrie. Vertical tube heat exchanger panel for waste-recovery boilers such as black liquid boilers or household waste incinerator furnaces, and methods of manufacture. 4,638,857, Cl. 165-162.000.

Fox, Duke. Porting system for two cycle internal combustion engines. 4,638,770, Cl. 123-65.00P.

Foxboro Company, The: *See*—
Sgourakes, George E., 4,638,656, Cl. 73-4.00R.

Frabel, Claude: *See*—
Lee, James, 4,638,884, Cl. 181-141.000.

Fram, Jerry. Slitting and dicing machine for fiberglass mat and mats of other brittle abrasive fibers. 4,638,934, Cl. 225-97.000.

Franke, Hans G., to Eastman Kodak Company. Method and apparatus for fixing toner images. 4,639,405, Cl. 430-124.000.

Franke, Martin G., to Franke, Martin G. Picture display case. 4,639,725, Cl. 340-815.020.

Franke, Paul G.: *See*—
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., 4,639,254, Cl. 604-385.00R.

Frankel, Alfred R. Sweat collecting headband. 4,638,512, Cl. 2-171.000.

Frankland, James D., Jr., to New Castle Industries, Inc. Extrusion screw. 4,639,143, Cl. 366-89.000.

Frascaroli, Francesco; and Biondi, Carlo, to C.O.M. Cooperativa Operai Metallurgici S.C.R.L. Modular furniture. 4,639,049, Cl. 312-195.000.

Frayer, Paul D., to Rogers Corporation. Co-solvent accelerator for conversion of polyamide-acid solution to polyimide. 4,639,485, Cl. 524-378.000.

Frederick, Raymond L. Combination sawhorse and sawbuck. 4,638,885, Cl. 182-151.000.

Fredericks, Chester P. Thermally insulative self-supporting panel. 4,638,616, Cl. 52-397.000.

Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., to Association pour la Recherche et le Developpement des Methodes et Processus Industriels "A.R.M.I.N.E.S." ; Societe Imphy S.A.; Office National d'Etudes et de Recherche Aerospatiales (ONERA); and Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Monocrystalline alloy with a nickel matrix basis. 4,639,280, Cl. 148-404.000.

Fredrickson, Eric, to C&K Components, Inc. Key lock switch with antistatic means. 4,639,562, Cl. 200-43.080.

Fribault, Gerard: *See*—
Hullein, Francois; and Fribault, Gerard, 4,639,129, Cl. 356-5.000.

Fried, David L., to D. L. Fried Associates, Inc. Moving target indication system. 4,639,774, Cl. 358-105.000.

Friedrich Wilh. Schwing GmbH: *See*—
Guthoff, Wilfred, 4,639,183, Cl. 414-705.000.

Frierdich, Waldo J., to Basler Electric Company. Electrical control apparatus and methods. 4,639,657, Cl. 322-59.000.

Frings, Heinz; Kabelitz, Hans-Peter; and Ronthaler, Karl-Heinz, to Leybold-Heraeus GmbH. Two-shaft vacuum pump with internal compression. 4,639,199, Cl. 418-3.000.

Froelich, Hans; Hepperle, Willi; Katzer, Johann; and Stephany, Christian, to Gardena Kress & Kastner GmbH. Joint for a water-carrying pipe system. 4,639,018, Cl. 285-184.000.

Frohnert, Heinz: *See*—
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.

Fu, Wallace Y.: *See*—
Fellows, Constance A.; and Fu, Wallace Y., 4,639,536, Cl. 549-462.000.

Fuchs, Ernst; and Fitzi, Karl, to Mecapec S.A. Apparatus for mechanical purification of waste water. 4,639,315, Cl. 210-333.100.

Fuji Electric Co., Ltd.: *See*—
Kuroki, Kazuo, 4,639,823, Cl. 361-159.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Inaba, Mitsuharu; Sekiguchi, Takashi; Yoneyama, Yoshio; and Suzuki, Tadashi, 4,639,182, Cl. 414-543.000.
Sakai, Yasuhito, 4,638,689, Cl. 74-866.000.

Fuji Photo Film Co., Ltd.: *See*—
Akao, Mutsuo, 4,639,386, Cl. 428-35.000.
Aono, Toshiaki; and Hara, Hiroshi, 4,639,407, Cl. 430-203.000.
Arai, Yoshihiro; and Nahara, Akira, 4,639,815, Cl. 360-131.000.
Ferrier, Herman, 4,639,794, Cl. 360-46.000.
Kawagishi, Toshio; and Nakazyo, Kiyoshi, 4,639,413, Cl. 430-546.000.
Kitaguchi, Hiroshi; and Kato, Masatoshi, 4,639,408, Cl. 430-351.000.
Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, 4,639,118, Cl. 355-29.000.
Sakaguchi, Yukihiko, 4,639,414, Cl. 430-550.000.
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,639,418, Cl. 430-617.000.
Yamamoto, Soichiro; and Shimada, Takeo, 4,639,409, Cl. 430-505.000.
Yoshida, Tetsuo; and Kokubo, Tadayoshi, 4,639,416, Cl. 430-567.000.

Fuji Photo Optical Co., Ltd.: *See*—
Tanaka, Kazuto; Kakizawa, Haruo; and Nagata, Kouichi, 4,639,099, Cl. 350-538.000.

Fuji Xerox Co., Ltd.: *See*—
Ishii, Chiharu, 4,639,894, Cl. 365-189.000.

Fujii, Setsuro; Yokoyama, Touru; Ikegaya, Kouji; Yokoo, Nobuo; and Nagakura, Masahiko, to Kowa Co., Ltd. Pharmaceutical composition suitable for intestinal administration. 4,639,435, Cl. 514-11.000.

Fujikawa, Yoshihiro; Sakashita, Mitsuaki; and Tsuruzoe, Nobutomo, to Nissan Chemical Industries Ltd. 3,5-dialkyl-4,6-diaryl-tetrahydro-2H-1,3,5-thiadiazine-2-thione derivative, process for its production and antihyperlipidemic agent containing it. 4,639,444, Cl. 514-222.000.

Fujimaki, Kazuo: *See*—
Maruyama, Hidekazu; and Fujimaki, Kazuo, 4,639,037, Cl. 297-334.000.

Fujimori, Kyoichi: *See*—
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.

Fujinawa, Tomoaki: *See*—
Nohara, Fujio; and Fujinawa, Tomoaki, 4,639,523, Cl. 546-209.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,639,448, Cl. 514-226.000.

Fujita, Akira; and Shimizu, Kyoichi, to Victor Company of Japan, Ltd. Video signal processing apparatus for processing a video signal which is transmitted in accordance with a dot interlaced schanning system and inputted thereto. 4,639,782, Cl. 358-166.000.

Fujita, Hiroshi: *See*—
Komatsu, Masao; and Fujita, Hiroshi, 4,639,363, Cl. 423-644.000.

Fujita, Tadahiro: *See*—
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.

Fujita, Yasuhiko: *See*—
Masuda, Eiji; and Fujita, Yasuhiko, 4,639,554, Cl. 340-365.00S.

Fujita, Yasuyuki; and Nishino, Takaichi, to Tachikawa Spring Co., Ltd. Fixing device for a vehicle seat. 4,639,040, Cl. 297-379.000.

Fujitsu Limited: *See*—
Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.
Matsumoto, Seikichi; and Ikeda, Hiroyuki, 4,639,071, Cl. 350-3.710.
Ohtsuki, Osamu, 4,639,940, Cl. 377-60.000.

Fujiwara, Kohji: *See*—
Maeda, Yoshinobu; Fujiwara, Kohji; and Naito, Takao, 4,638,985, Cl. 269-244.000.

Fukae, Kensuke; and Yamashita, Keitaro, to Kentek Information Systems, Inc. Printer/copier with disposable toner cartridge. 4,639,116, Cl. 355-3.0DD.

Fukazawa, Nobuyuki: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.

Fuke, Takamichi, to Alps Electric Co., Ltd. Intermittent drive member. 4,638,677, Cl. 74-84.00R.

Fukuda, Kazuichi, to Shoyo Engineering Company Limited. Shaft coupling with press fit coil springs forming resilient torque-transmitting elements. 4,639,237, Cl. 464-65.000.

Fukuda, Kiyoshi: *See*—
Shimbo, Masaru; Fukuda, Kiyoshi; and Ohwada, Yoshiaki, 4,638,552, Cl. 29-576.00J.

Fukuoka, Yoshitaka, to Kabushiki Kaisha Toshiba. Packaged electronic device. 4,639,830, Cl. 361-411.000.

Fukushima, Takeo: *See*—
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.

Full Vision, Inc.: *See*—
Benson, David A.; and Dilts, Ray A., 4,638,665, Cl. 72-389.000.

Furlong, James J.; and Howe, Dwayne E., to Boeing Company, The. Touch sensor for wire stripper. 4,639,824, Cl. 361-179.000.

Furomoto, Yoshiyuki, to Shimano Industrial Company Limited. Fishing reel. 4,638,958, Cl. 242-84.10R.

Furukawa, Toshio, to Tachikawa Spring Co., Ltd. Headrest mounting structure for a vehicle seat. 4,639,041, Cl. 297-391.000.

Furuta, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Fault determining apparatus for data transmission system. 4,639,917, Cl. 371-16.000.

Fushiya, Fusao; Hakamata, Nobuo; Abe, Hiroyuki; and Inoue, Nobuhiro, to Makita Electric Works, Ltd. Portable miter saws. 4,638,700, Cl. 83-467.00R.

Fuziwara, Yutaka; and Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Lens mounting. 4,639,083, Cl. 350-255.000.

G. D. Searle & Co.: *See*—
Desai, Bipinchandra N.; Chorvat, Robert J.; and Rorig, Kurt J., 4,639,524, Cl. 546-229.000.

GA Technologies Inc.: *See*—
Bass, John C.; and Elsner, Norbert B., 4,639,542, Cl. 136-210.000.

Gabriel, Alexander, to Nordson Corporation. Adjustable powder spray nozzle. 4,638,951, Cl. 239-707.000.

Gagin, William P., to American Orthodontics Corporation. Surgical ball hooks. 4,639,219, Cl. 433-22.000.

Gagliani, John: *See*—
Long, John V.; and Gagliani, John, 4,639,343, Cl. 264-45.500.

Gaiser, Hans. Sidepiece end of a spectacle frame sidepiece. 4,639,104, Cl. 351-117.000.

Gajjar, Bharat J., to Du Pont de Nemours, E. I., and Company. Layered warp knits. 4,638,648, Cl. 66-193.000.

Gallardo, Mike. Safety lock for security window gratings. 4,638,596, Cl. 49-56.000.

Gallios, George C.; and Lien, Charles, to Venus Scientific Inc. Resonant current driven power source for low input voltages. 4,639,844, Cl. 363-17.000.

Galuska, Stefi.n: *See*—
Murray, Peter K.; and Galuska, Stefan, 4,639,372, Cl. 424-88.000.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Pocketed athletic shoe. 4,638,579, Cl. 36-136.000.

Gamroth, Michael: *See*—
Hilbrans, Hermann; Gamroth, Michael; Melcher, Gerhard; and Megerle, Friedrich, 4,639,269, Cl. 75-76.000.

Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., to Smith Kline & French Laboratories Limited. 2-substituted alkylaminopyrimidones useful as H_2-antagonists and antiinflamatory agents. 4,639,519, Cl. 544-320.000.

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Gannaway, Edwin L., to Tecumseh Products Company. Suction tube seal for a rotary compressor. 4,639,198, Cl. 417-410.000.

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Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,639,585, Cl. 235-492.000.

Garcia, Robert L. Floating fishing accessory. 4,638,593, Cl. 43-54.100.

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Froelich, Hans; Hepperle, Willi; Katzer, Johann; and Stephany, Christian, 4,639,018, Cl. 285-184.000.

Garrett Corporation, The: *See*—
McLean, John R., 4,638,634, Cl. 60-612.000.

Garrett, Michael E., to BOC Group plc, The. Dissolving gas in a liquid. 4,639,340, Cl. 261-36.100.

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Ollero-Pina, Juan C.; and Garrido-Diaz, Antonio, 4,638,914, Cl. 209-617.000.

Gary, James R., to Borg-Warner Corporation. Sensing system for measuring a parameter. 4,639,665, Cl. 324-117.00H.

Gasper, Kenneth E., to Olin Corporation. Boiler blowdown monitoring system and process for practicing same. 4,639,718, Cl. 340-603.000.

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Gaude, Maurice, to La Telemecanique Electrique. Circuit for controlling the base of a power transistor used in high tension switching. 4,639,616, Cl. 307-270.000.

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Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, 4,638,943, Cl. 237-7.000.

Gdovin, Wm. J.: *See*—
Waller, Francis E., 4,638,547, Cl. 29-558.000.
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Gebr. Hennig GmbH: *See*—
Schneider, Barbara; Hennig, Kurt; and Klein, Manfred, 4,638,722, Cl. 92-42.000.

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Misher, Hans-Peter; and Pietsch, Helge, 4,638,982, Cl. 267-131.000.

Gefitec S.A.: *See*—
Posso, Patrick P. P., 4,639,052, Cl. 312-333.000.

Geiger, Rolf: *See*—
Obermeier, Rainer; Geiger, Rolf; and Grau, Ulrich, 4,639,333, Cl. 530-303.000.

Geimer, Raymond C.; and Tolbert, William R., to Monsanto Company. Cell culture filter apparatus and method. 4,639,422, Cl. 435-286.000.

Geisthoff, Hubert; Buthe, Theo; and Mikeska, Felix, to Jean Walterscheid GmbH. Drawing lock for torque transmitting engagement between two shaft members arrestable in the open position. 4,639,162, Cl. 403-316.000.

Geisthoff, Hubert: *See*—
Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, 4,639,163, Cl. 403-322.000.

General Electric Company: *See*—
Cohen, Joseph D., 4,638,636, Cl. 60-741.000.
Giles, Harold F., Jr., 4,639,481, Cl. 524-128.000.
Howell, Edward K.; and Anderson, Thomas E., 4,639,933, Cl. 375-8.000.
Liu, Nan-I, 4,639,486, Cl. 524-409.000.
Macovski, Albert, 4,639,671, Cl. 324-309.000.
Payne, Thomas R., 4,639,578, Cl. 219-450.000.

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Einthoven, Willem G., 4,638,551, Cl. 29-571.000.

General Motors Corporation: *See*—
Bell, Albert H., III; and Johnson, Jesse F., 4,639,194, Cl. 416-241.00B.
Bonvallet, Duane J., 4,638,773, Cl. 123-90.160.
Chatterjee, Madhu S., 4,639,279, Cl. 148-147.000.
Daum, Ronald E., 4,639,057, Cl. 339-17.00F.
Gloomis, Lawrence A.; and Ches, Gregory S., 4,638,533, Cl. 24-633.000.
Gorman, Michael J.; and McClellan, William R., 4,638,678, Cl. 74-476.000.
Huesman, Edward H., 4,639,160, Cl. 403-71.000.
LeBlanc, Richard S., 4,638,715, Cl. 89-41.120.
McMahan, David R.; and Nicholas, Richard W., 4,639,840, Cl. 362-80.000.
McNeil, James E., 4,638,544, Cl. 29-434.000.
Nels, Terry E.; Eldridge, Larry; and Doty, Gerald L., 4,639,392, Cl. 428-283.000.
Sovacool, David K.; Van Slyke, Allan S.; and Bungo, Edward M., 4,638,964, Cl. 248-56.000.
Vonhausen, Georg, 4,638,977, Cl. 251-248.000.

General Signal Corporation: *See*—
Pappano, Thomas W.; and Brown, David O., 4,639,719, Cl. 340-652.000.

George, Martin C. J., to Stone Allen Limited. Heating system. 4,638,767, Cl. 122-448.00B.

Gerhard Collardin GmbH: *See*—
Schellenberg, Lutz; Hamacher, Matthias; and Ahmed, Bashir M., 4,639,319, Cl. 210-651.000.

Gerlach, Pierre: *See*—
Hoet, Roger; and Gerlach, Pierre, 4,639,633, Cl. 313-35.000.

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Becker, Kunibert; Kirchbrucher, Rudiger; and Preuschoff, Michael, 4,639,169, Cl. 405-291.000.

GEZE GmbH: *See*—
Scheck, Georg; Bogner, Martin; Schmidt, Manfred; and Kowatsch, Ulrich, 4,639,010, Cl. 280-615.000.

Ghiardo, Fiorenzo; and Maina, Bruno, to ROJ Electrotex S.p.A. Weft feeder for weaving looms. 4,638,840, Cl. 139-452.000.

Giakoumis, Alex, to U.S. Philips Corporation. Variable-bias circuit with HF transmission path. 4,639,617, Cl. 307-296.00R.

Giannetti, Anna; Massa, Sergio; and Re, Cesare, to S.r.l. LO.GI.CAM - Lombarda General Engeenering Costruzioni Automatiche. Publicity board with rotating prismatic members. 4,638,580, Cl. 40-503.000.

Gibod, Yves B.: *See*—
Val, Christian; Pinel, Joseph; and Gibod, Yves B., 4,639,826, Cl. 361-272.000.

Gicquel, Sylvain: *See*—
Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, 4,638,943, Cl. 237-7.000.

Gidseg, Edward. Circulating air refrigerator with removable divider shelf. 4,638,644, Cl. 62-329.000.

Gierenz, Gerhard: *See*—
Dierichs, Wolfgang; Gierenz, Gerhard; and Kraus, Gabriella, 4,639,475, Cl. 523-164.000.

Giesenberg, Peter: *See*—
Weber, Berthold; Giesenberg, Peter; and Steimel, Johannes, 4,639,589, Cl. 250-203.00R.

Gifford, Michael F.; and Coffman, James H., to Coffman Systems, Inc. Coin counter. 4,638,825, Cl. 133-8.00R.

Giles, Harold F., Jr., to General Electric Company. Modified thermoplastic polyester molding compositions and articles molded therefrom. 4,639,481, Cl. 524-128.000.

Gillet, Claude L.: *See*—
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Gillette Company, The: *See*—
Walsh, William H., 4,638,653, Cl. 72-129.000.

Gilmore, Dennis W.; and Kugele, Thomas G., to Morton Thiokol, Inc. Asphalt-adhesion improving additives prepared by formaldehyde condensation with polyamines. 4,639,273, Cl. 106-281.00N.

Gilmore, G. W.: *See*—
Clark, Gary E., 4,638,997, Cl. 273-1.0GD.

Gilsdorf, John F.: *See*—
Toegel, Herbert J.; Yudichak, Joseph R.; and Gilsdorf, John F., 4,639,910, Cl. 370-58.000.

Giulini Chemie GmbH: *See*—
Schanz, Klaus, 4,639,362, Cl. 423-554.000.

GIW Industries, Inc.: *See*—
Day, Wallace, 4,638,847, Cl. 164-55.100.

Glaseman, Richard W.: *See*—
Podany, Clayton J.; and Glaseman, Richard W., 4,638,565, Cl. 33-265.000.

Glatt, Ilana; Livnat, Aminadav; and Kafri, Oded, to State of Isreal, The. Direct determination of modulation transfer function by moire deflectrometry. 4,639,132, Cl. 356-124.500.

Glenn, William E., to New York Institute of Technology. Video display method and apparatus. 4,639,788, Cl. 358-233.000.

Gloomis, Lawrence A.; and Ches, Gregory S., to General Motors Corporation. Variable release seat belt buckle. 4,638,533, Cl. 24-633.000.

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Day, Chia P.; Krause, Kenneth W.; Whitcomb, Louis L.; and Horn, Berthold K. P., 4,639,878, Cl. 364-513.000.

Goel, Anil B., to Ashland Oil, Inc. Poly (ether amide) composition from reaction of bis bicyclic amide acetal with bis- or poly-phenolic material. 4,639,505, Cl. 528-211.000.

Goerrissen, Heiner: *See*—
Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, 4,639,488, Cl. 524-456.000.

Goff, Charles W.; and Goff, Charles W., Jr. Machine gun receiver top strap. 4,638,716, Cl. 89-199.000.

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Gogarty, Brian J. Quick-bolt locking system. 4,638,994, Cl. 272-122.000.

Gold, Peter N. Force hinge connection for the latching mechanism of a panel truck or van window. 4,638,598, Cl. 49-394.000.

Goldmann, Peter, to U.S. Philips Corporation. System for recording or detecting two marking signals on a record carrier. 4,639,793, Cl. 360-44.000.

Gonthier, Bruno F.: *See*—
Lelu, Andre E.; Grignon, Jean R.; Gonthier, Bruno F.; and Tauzia, Jean-Michel, 4,638,735, Cl. 102-290.000.

Goodhues, George S., Jr. Underground facility for storage of liquids. 4,638,920, Cl. 220-445.000.

Goodloe, Kent J., to Western Geophysical Co. of America. Dual-mode vibrator. 4,639,905, Cl. 367-189.000.

Goodrich, Judson E., to Chevron Research Company. Method for producing industrial asphalts. 4,639,307, Cl. 208-44.000.

Goodwin, John J.; and Lu, Nicky C., to International Business Machines Corporation. Boosting word-line clock circuit for semiconductor memory. 4,639,622, Cl. 307-482.000.

Goolsby, Alvin D., to Shell Oil Company. Cathodic protection monitoring system. 4,639,677, Cl. 324-425.000.

Goossens, John: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.

Gorman, Michael J.; and McClellan, William R., to General Motors Corporation. Manual transmission shift control mechanism having a reverse inhibitor. 4,638,678, Cl. 74-476.000.

Goto, Humio: *See*—
Wada, Hideo; and Goto, Humio, 4,639,862, Cl. 364-200.000.

Goto, Kunio, to Victor Company of Japan, Limited. Magnetic recording on tracking controlled grooveless medium having magnetic and capacitance properties. 4,639,906, Cl. 369-14.000.

Goto, Sohei: *See*—
Mochizuki, Yoshihara; Goto, Sohei; Yagi, Toshihiko; Yamazaki, Katsumasa; and Michiue, Kenji, 4,639,410, Cl. 430-506.000.

Gottlieb, Milton; and Schaff, Fredrick L., to Westinghouse Electric Corp. Acousto-optic dispersive light filter. 4,639,092, Cl. 350-372.000.

Gould Electronics B.V.: *See*—
Bergmans, Anthony B., 4,638,661, Cl. 73-237.000.

Goyert, Wilhelm: *See*—
Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, 4,639,478, Cl. 524-97.000.

Gradin, James H., to Sundstrand Data Control, Inc. Aircraft video projection system. 4,639,106, Cl. 353-13.000.

Graeser, Ulrich: *See*—
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.

Graf, Heinrich, to SIG Schweizerische Industrie-Gesellschaft. Package with transferable reusable closure element. 4,638,912, Cl. 206-621.000.

Gragson, James T.: *See*—
Schuettenberg, Alexander D.; and Gragson, James T., 4,639,255, Cl. 44-62.000.

Graham, Randolph H.: *See*—
Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-73.000.
Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., 4,639,863, Cl. 364-200.000.

Granberg, Helge O.; and Coffman, Samuel L., to Motorola, Inc. High power RF transistor assembly. 4,639,760, Cl. 357-75.000.

Granzow, Robert H.; and Gupta, Desh B., to NCR Corporation. Position control for a stacker wheel. 4,638,993, Cl. 271-315.000.

Grau, Ulrich, to Hoechst Aktiengesellschaft. Process for the preparation of insulin derivatives. 4,639,332, Cl. 530-303.000.

Grau, Ulrich: *See*—
Obermeier, Rainer; Geiger, Rolf; and Grau, Ulrich, 4,639,333, Cl. 530-303.000.

Gravel, James L.: *See*—
Brown, Gregory C.; and Gravel, James L., 4,638,830, Cl. 137-83.000.

Graves, Gene E., to Harris Graphics Corporation. Brake engagement mechanism for a web press. 4,638,957, Cl. 242-58.600.

Graziano, Peter J.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Green, John G.; and Hunt, David G., to Dow Chemical Company, The. N-vinyl-2-oxazolidinones as reactive diluents in actinic radiation curable coatings. 4,639,472, Cl. 522-107.000.

Green, Michael D.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Greenberg, Bernard. Animal litter formulation. 4,638,763, Cl. 119-1.000.

Greenberg, Burton L. Method and apparatus for the automatic identification and verification of television broadcast programs. 4,639,779, Cl. 358-142.000.

Greig, David A.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Grenzendoerfer, Dietmar; Wierzgon, Achim; Mueller, Gerhard; Erth, Dieter; Guenther, Ludwig; and Kuenzel, Rolf, to VEB Kombinat Textima. Method and flat warp-knitting machine for the production of a weft-and-warp-knit fabric. 4,638,647, Cl. 66-84.00A.

Gressler, Walter; and Kern, Karl, to Robert Bosch GmbH. Bag package transfer apparatus. 4,639,185, Cl. 414-733.000.

Greter, Andreas: *See*—
Borer, Claude; and Greter, Andreas, 4,639,135, Cl. 356-246.000.

Grethe, Klaus, to L. & C. Steinmuller GmbH. Method of spraying additives in an intensively mixing manner into a combustion chamber for binding sulfur. 4,639,209, Cl. 431-4.000.

Griffin, William M.: *See*—
Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., 4,638,865, Cl. 166-274.000.

Grignon, Jean R.: *See*—
Lelu, Andre E.; Grignon, Jean R.; Gonthier, Bruno F.; and Tauzia, Jean-Michel, 4,638,735, Cl. 102-290.000.

Grigsby, David A.: *See*—
Knasel, Harold E.; and Grigsby, David A., 4,639,184, Cl. 414-730.000.

Grisar, Gunter. Joint cuff. 4,638,794, Cl. 128-80.00H.

Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, to L'Oreal. Hair-setting process. 4,638,822, Cl. 132-7.000.

Gross, Alexander L.: *See*—
Parracho, Rui M.; Smith, Lloyd S.; Bunch, Richard P.; and Gross, Alexander L., 4,638,576, Cl. 36-68.000.

Grossmann, Stefan; and Nitzsche, Erhard, to EB Kombinat Polygraph "Werner Lamberz" Leipzig. Arrangement for printing machine plate cylinder zero position adjustment. 4,638,734, Cl. 101-248.000.

Group Lotus Cap Companies PLC: *See*—
Williams, David A.; and Wright, Peter G., 4,639,013, Cl. 280-707.000.

Groves, James D.: *See*—
Billigmeier, James E.; Groves, James D.; Haugen, Harwick A.; and Pokorny, Richard J., 4,639,483, Cl. 524-296.000.

Grubbs, Harvey J.: *See*—
Cox, Richard H.; Grubbs, Harvey J.; and Haut, Stephen A., 4,638,816, Cl. 131-276.000.

Grunert, Kurt A.; Walker, Roger E.; Paton, Charles R.; and Leone, David A., to Westinghouse Electric Corp. Circuit breaker with arc chamber vent. 4,639,564, Cl. 200-144.00R.

Grunig, Rudolf: *See*—
Berger, Erwin; and Grunig, Rudolf, 4,639,581, Cl. 235-101.000.

Gruodis, Algirdas J.: *See*—
Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., 4,639,919, Cl. 371-27.000.

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Belanger, Thomas D., Jr., 4,638,937, Cl. 228-5.500.

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Taubner, Fred R.; and Roy, Joseph A., 4,639,637, Cl. 313-489.000.

GTO Electronics: *See*—
Persson, Eric G.; and Veith, Ronald D., 4,639,845, Cl. 363-26.000.

Guenther, Ludwig: *See*—
Grenzendoerfer, Dietmar; Wierzgon, Achim; Mueller, Gerhard; Erth, Dieter; Guenther, Ludwig; and Kuenzel, Rolf, 4,638,647, Cl. 66-84.00A.

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Andersson, Ralf G., 4,639,318, Cl. 210-491.000.

Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, to Dornier GmbH. Jumbo aircraft, in particular of high-wing monoplane design. 4,638,962, Cl. 244-203.000.

Gunther, Walter, to W. Gunther GmbH. Acceleration and deceleration sensor. 4,639,563, Cl. 200-61.45M.

Gupta, Desh B.: *See*—
Granzow, Robert H.; and Gupta, Desh B., 4,638,993, Cl. 271-315.000.

Gustafson, Bengt G., to U.S. Philips Corporation. Method and a system for monitoring a sea area. 4,639,900, Cl. 367-5.000.

Guthoff, Wilfred, to Friedrich Wilh. Schwing GmbH. Bucket excavator. 4,639,183, Cl. 414-705.000.

Guttag, Karl M.: *See*—
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.

Guyot, Alain: *See*—
Richard, Philippe; Papillon, Jean-Charles; Guyot, Alain; and Corbellini, Carlo, 4,638,838, Cl. 138-30.000.

Haack, Peggy J. Bowling glove. 4,638,511, Cl. 2-161.00A.

Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, to Bayer Aktiengesellschaft. Bismorpholines, a process for their preparation and their use for protection against hydrolysis. 4,639,478, Cl. 524-97.000.

Habermann, Heinz P., to Ford Motor Company. Intermediate bearing for the propeller shaft of a motor vehicle. 4,639,150, Cl. 384-536.000.

Hack, Helmuth: *See*—
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,639,526, Cl. 548-140.000.

Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., to Issledovatelski Centar "Tekom" . Box-unit and molding apparatus for its production. 4,638,607, Cl. 52-79.900.

Hafele, Carl H. Rotary drive lock. 4,638,650, Cl. 70-179.000.

Hager, Juergen; Vieth, Walter; and Manderla, Werner, to Maguirt-Gefrierschneider GmbH. Frozen meat cutter. 4,638,697, Cl. 83-356.300.

Haghiri-Tehrani, Yahya; and Hoppe, Joachim, to GAO Gesellschaft fur Automation und Organisation mbH. Data carrier with an IC module and a method for producing such a data carrier. 4,639,585, Cl. 235-492.000.

Hagiwara, Mitsuo: *See*—
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.

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Fushiya, Fusao; Hakamata, Nobuo; Abe, Hiroyuki; and Inoue, Nobuhiro, 4,638,700, Cl. 83-467.00R.

Hakkinen, Taisto, to Etela Hameen Keuhkovammyhdistys R.Y. Exhalation flow meter. 4,638,812, Cl. 128-726.000.

Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, to Teijin Limited; and Kitanihon Spinning Co., Ltd. False twist crimped yarn having improved coherency. 4,638,624, Cl. 57-208.000.

Hall, John M., to Rolls-Royce Limited. Variable configuration exhaust discharge opening for a jet propulsion engine. 4,638,946, Cl. 239-265.330.

Hall, Joseph P. Fishing lure. 4,638,586, Cl. 43-42.130.

Hall, Leon. Apparatus for converting a standard telephone to an unlisted number telephone. 4,639,552, Cl. 379-199.000.

Hall, Stanley D.: *See*—
Dyer, John; Kennette, John W.; Bassett, Alton H.; and Hall, Stanley D., 4,639,253, Cl. 604-362.000.

Hall-Wilton, Michael J.: *See*—
Sperinck, William A.; and Hall-Wilton, Michael J., 4,638,675, Cl. 73-864.340.

Hallgren, Robert B.: *See*—
Baldwin, Gary; Hallgren, Robert B.; Hornak, Thomas; and Ives, Fred H., 4,639,619, Cl. 307-352.000.

Halliburton Company: *See*—
Zunkel, Gary D.; and Bolin, Michael L., 4,638,859, Cl. 166-51.000.

Hamabe, Yoshifumi: *See*—
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Hamacher, Matthias: *See*—
Schellenberg, Lutz; Hamacher, Matthias; and Ahmed, Bashir M., 4,639,319, Cl. 210-651.000.

Hamada, Eiichi: *See*—
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Kuwabara, Yoshiharu; and Hamada, Hiroyoshi, 4,639,141, Cl. 356-387.000.

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Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; and Kuroda, Akio, 4,639,908, Cl. 369-288.000.

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Murakami, Seiro; and Hamajima, Muneki, 4,639,604, Cl. 250-548.000.

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Wang, Shing C.; and Hamerdinger, Randolph W., 4,639,926, Cl. 372-87.000.

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Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel J.; and Kaluszynski, Michel, 4,638,984, Cl. 269-43.000.

Hanamoto, Keiji; and Takagi, Fumio, to Dai Nippon Insatsu Kabushiki Kaisha. Method for injection molding articles while simultaneously forming patterns thereon. 4,639,341, Cl. 264-40.100.

Hanaoka, Katsumi: *See*—
Tanaka, Kazuhiro; Yamamoto, Yasuo; Hanaoka, Katsumi; and Hirai, Masatake, 4,639,707, Cl. 336-185.000.

Hancock, Jack A.; Johnson, Walter D.; and Kennedy, Alan D., to Du Pont de Nemours, E. I., and Company. Process of making crimped, annealed polyester filaments. 4,639,347, Cl. 264-291.000.

Hanna, Marie R.: *See*—
Sprecker, Mark A.; and Hanna, Marie R., 4,639,330, Cl. 252-522.00R.

Hannart, Jean A. A. J.: *See*—
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., 4,639,456, Cl. 514-283.000.

Hannesen, Kurt: *See*—
Staab, Rudolf; Bergner, Dieter; and Hannesen, Kurt, 4,639,503, Cl. 204-258.000.

Hansen, Loren F.; and Lamb, Mark E., to Outboard Marine Corporation. Tine holder for turf aerating apparatus. 4,638,867, Cl. 172-22.000.

Hansen, Werner, to Beiersdorf Aktiengesellschaft. Substituted 1-(4-amino-6,7-dialkoxyquinazolinyl)-4 cyclohexenyl derivatives of piperazine and homopiperazine, processes for their preparation and their use, formulations containing these compounds and intermediates. 4,639,453, Cl. 514-254.000.

Hanson, Harvey E.; and Amaniera, John A. Device for sharpening single-flute countersinks. 4,638,603, Cl. 51-219.00R.

Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, to Janome Sewing Machine Co., Ltd. Sewing machine with a device for setting thread tension. 4,638,751, Cl. 112-254.000.

Hara, Akio: *See*—
Kodama, Mitsuo; Miyake, Masaya; Nakano, Minol; Asai, Tsuyoshi; and Hara, Akio, 4,639,352, Cl. 419-15.000.

Hara, Hajime; Orii, Shingo; Aoyama, Kazuho; and Enomoto, Masami, to Nippon Oil Co., Ltd. Thermosetting resin composition. 4,639,503, Cl. 528-92.000.

Hara, Hiroshi: *See*—
Aono, Toshiaki; and Hara, Hiroshi, 4,639,407, Cl. 430-203.000.

Hara, Kazumasa: *See*—
Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,638,751, Cl. 112-254.000.

Hara, Kumiko: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.

Harada, Yoshihito: *See*—
Sakai, Shinji; Kawabata, Takashi; and Harada, Yoshihito, 4,639,108, Cl. 354-289.100.

Harara, Mitsuhiko: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.

Harden, Kendall L.: *See*—
Bedenk, William T.; and Harden, Kendall L., 4,638,907, Cl. 206-0.500.

Harlan, Richard A.: *See*—
Basseen, Sanjiv K.; and Harlan, Richard A., 4,638,852, Cl. 165-47.000.

Harness, James R.: *See*—
Olson, Douglas R.; Harness, James R.; and Waterston, John W., 4,639,419, Cl. 435-5.000.

Harrell, David P., to American Standard Inc. Propeller pitch controlling arrangement having a fuel economizing feature. 4,639,192, Cl. 416-27.000.

Harris Corporation: *See*—
Brannigan, Michael J.; and Rutledge, David L., 4,639,896, Cl. 365-200.000.
Laude, David P., 4,639,684, Cl. 330-259.000.
McRae, Daniel D.; and Cain, Joseph B., III, 4,639,937, Cl. 375-40.000.
Rympalski, William P.; Herstein, James S.; and Ritenour, Roger L., 4,639,720, Cl. 340-712.000.

Harris Graphics Corporation: *See*—
Graves, Gene E., 4,638,957, Cl. 242-58.600.
Winiasz, Michael E., 4,638,906, Cl. 198-803.900.

Harris, Timothy S.; and Harrod, Lawrence R., to Kransco Manufacturing, Inc. Two pedal, three-way control for child's riding toy. 4,639,646, Cl. 318-139.000.

Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., to Quantum Corporation. Disk drive having two interactive electromechanical control subsystems. 4,639,798, Cl. 360-73.000.

Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., to Plus Development Corporation. Modular unitary disk file subsystem. 4,639,863, Cl. 364-200.000.

Harrod, Lawrence R.: *See*—
Harris, Timothy S.; and Harrod, Lawrence R., 4,639,646, Cl. 318-139.000.

Harry Hill Associates: *See*—
Sturdevant, Eugene J., 4,639,577, Cl. 219-399.000.

Hart, Joseph D.; and Wells, R. Leon, to Wells, R. Leon. Centrifugal fan liner and installing tool therefor. 4,639,191, Cl. 415-196.000.

Hartl, Christof; and Wagner, Hans, to Siemens Aktiengesellschaft. Hearing aid with a flexible printed circuit board. 4,639,556, Cl. 381-68.600.

Hartwig, Carl S. M., to Institut Cerac S. A. Drive system for A.C. motors. 4,639,645, Cl. 318-51.000.

Hartwig, Jurgen, to Pfaff Haushaltmaschinen GmbH. Sewing machine for producing a stitch pattern. 4,638,752, Cl. 112-458.000.

Harvey, Donald M., to Eastman Kodak Company. Pseudo format camera with exposure control. 4,639,111, Cl. 354-481.000.

Hasegawa, Tsunao, to Pioneer Electronic Corporation. Waveform reshaping circuit. 4,639,681, Cl. 328-164.000.

Hashimoto, Masahiro; Watanabe, Tsuyoshi; and Wada, Kenichi, to Hitachi, Ltd. Arithmetic system having pipeline structure arithmetic means. 4,639,886, Cl. 364-736.000.

Hashimoto, Ritsuo: *See*—
Matsumoto, Hiromichi; and Hashimoto, Ritsuo, 4,639,889, Cl. 364-900.000.

Hashimoto, Tamotsu: *See*—
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.

Hashimoto, Toshihiko: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, 4,639,441, Cl. 514-195.000.

Hasler AG Bern: *See*—
Berger, Erwin; and Grunig, Rudolf, 4,639,581, Cl. 235-101.000.

Hassellof, Ake; Lenasson, Carl-Gustaf; and Nordhall, Lennart, to ASEA Aktiebolag. Method for manufacturing railway wheels. 4,638,540, Cl. 29-168.000.

Hata, Katsuhiko; and Yamakami, Takahiko, to Sony Corporation. Resistors for use in cathode ray tubes. 4,639,640, Cl. 315-3.000.

Hatano, Tsuyoshi: *See*—
Murata, Yoshitaka; Hatano, Tsuyoshi; and Ohkubo, Hideo, 4,638,526, Cl. 15-367.000.

Hattori, Eiichi: *See*—
Umemoto, Sumio; Hattori, Eiichi; and Kamakari, Ryutaro, 4,639,384, Cl. 427-290.000.

Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, to Isuzu Motors Limited. Method and apparatus for controlling electronically controlled transmissions. 4,638,690, Cl. 74-866.000.

Hattori, Yoshihisa; and Inoue, Nobuo, to Kabushiki Kaisha Toshiba. Image processing system. 4,639,771, Cl. 358-80.000.

Haugen, Harwick A.: *See*—
Billigmeier, James E.; Groves, James D.; Haugen, Harwick A.; and Pokorny, Richard J., 4,639,483, Cl. 524-296.000.

Hauni-Werke Korber & Co. Kg.: *See*—
Heitmann, Uwe, 4,639,592, Cl. 250-223.00B.

Haut, Stephen A.: *See*—
Cox, Richard H.; Grubbs, Harvey J.; and Haut, Stephen A., 4,638,816, Cl. 131-276.000.

Hawkins, Gilbert A., to Eastman Kodak Company. Semiconductor material on a substrate, said substrate comprising, in order, a layer of organic polymer, a layer of metal or metal alloy and a layer of dielectric material. 4,639,277, Cl. 148-33.300.

Hawkins, William G.: *See*—
Drake, Donald J.; Hawkins, William G.; and Campanelli, Michael R., 4,639,748, Cl. 346-140.00R.

Hawley, Frank D.; and Rogers, Russell L., to Aeroquip Corporation. Closed circuit refueling nozzle. 4,638,842, Cl. 141-302.000.

Hayakawa, Masatoshi: *See*—
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.

Hayashi, Steven J.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Hayashi, Yukitaka: *See*—
Moribe, Yoshihiro; Hayashi, Yukitaka; Maekawa, Hideo; and Tsukui, Kunitsugu, 4,639,804, Cl. 360-105.000.

Hayashiguchi, Seizo. Window screen. 4,638,844, Cl. 160-23.00R.

Haybuster Manufacturing, Inc.: *See*—
Kopecky, Ivyl D., 4,638,748, Cl. 111-7.000.

Hazaki, Eiichi: *See*—
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, 4,639,146, Cl. 384-99.000.

Hazan, Jean-Pierre; and Steers, Michel, to U. S. Philips Corporation. Method of and device for determining when a liquid-renewal process is to be terminated. 4,639,137, Cl. 356-339.000.

Hazelton, Donald R.; and Puydak, Robert C., to Exxon Research & Engineering Co. Heat shrinkable thermoplastic olefin composition. 4,639,487, Cl. 524-425.000.

Heath, Thomas E. Device for handling fluids drained from a vehicle. 4,638,841, Cl. 141-98.000.

Hegg, Jeffrey W., to Honeywell Inc. Float stabilized constant current source. 4,639,658, Cl. 323-204.000.

Heichberger, Albert N. Method and apparatus for carbon dioxide liquefaction and evaporation. 4,639,262, Cl. 62-11.000.

Heidelberger Druckmaschinen AG: *See*—
Blasius, Udo; and Rodi, Anton, 4,639,727, Cl. 340-825.570.

Heikkinen, Urho, to Elevator GmbH. Theatrical stage. 4,638,610, Cl. 52-109.000.

Heilmann, Steven M.: *See*—
Rasmussen, Jerald K.; Heilmann, Steven M.; and Palensky, Frederick J., 4,639,286, Cl. 156-307.300.

Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., to Texas Instruments Incorporated. Video display system using memory with parallel and serial access employing selectable cascaded serial shift registers. 4,639,890, Cl. 364-900.000.

Heintz, Wolfgang; Pehker, Manfred; and Metz, Josef, to Rheinmetall GmbH. Cannon with longitudinally shiftable barrel. 4,638,714, Cl. 89-37.010.

Heinz, Gerhard: *See*—
Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, 4,639,488, Cl. 524-456.000.

Heinze, Udo; and Marhoff, Paul, to Siemens Aktiengesellschaft. X-ray diagnostic system with automatic control of radiation exposure. 4,639,943, Cl. 378-96.000.

Heitmann, Uwe, to Hauni-Werke Korber & Co. Kg. Cigarette testing apparatus. 4,639,592, Cl. 250-223.00B.

Helfer, Paul E.: *See*—
Jones, Marvin R.; and Helfer, Paul E., 4,638,972, Cl. 251-1.300.

Heling, Dennis H., to Chrysler Motors Corporation. Vehicle easy entry seat track with one position memory. 4,639,038, Cl. 297-341.000.

Heller, Jorge, to Merck & Co., Inc. Polymers containing pendant acid functionalities and labile backbone bonds. 4,639,366, Cl. 424-19.000.

Henkel Corporation: *See*—
Virnig, Michael J.; and Clark, James P., 4,639,540, Cl. 558-444.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Dierichs, Wolfgang; Gierenz, Gerhard; and Kraus, Gabriella, 4,639,475, Cl. 523-164.000.
Ritter, Wolfgang, 4,639,498, Cl. 526-196.000.
Stahl, Peter H.; and Schmitz, Beat, 4,639,338, Cl. 260-502.50C.

Hennig, Kurt: *See*—
Schneider, Barbara; Hennig, Kurt; and Klein, Manfred, 4,638,722, Cl. 92-42.000.

Henry, Richard D. Basic flight instrument. 4,638,660, Cl. 73-178.00R.

Henzler, Martin, to Leybold-Heraeus GmbH. System for deflecting a beam of charged particles. 4,639,602, Cl. 250-396.00R.

Hepperle, Willi: *See*—
Froelich, Hans; Hepperle, Willi; Katzer, Johann; and Stephany, Christian, 4,639,018, Cl. 285-184.000.

Her Majesty the Queen in right of Canada: *See*—
Wright, David A.; and Webb, David B., 4,639,229, Cl. 441-42.000.

Hercules Incorporated: *See*—
Bloothoofd, William, 4,638,758, Cl. 118-412.000.

Herculite Protective Fabrics Corporation: *See*—
Von Kohorn, Henry; and Kydonieus, Agis F., 4,639,393, Cl. 428-304.400.

Hernandez, Jose L. Electrical wall bracket. 4,638,963, Cl. 248-56.000.

Herstein, James S.: *See*—
Rympalski, William P.; Herstein, James S.; and Ritenour, Roger L., 4,639,720, Cl. 340-712.000.

Herzfeld, Jason H. Sectionalized folder. 4,639,157, Cl. 402-19.000.

Hess, Jack H., to Air Plus, Inc. Fluidized hospital bed. 4,638,519, Cl. 5-455.000.

Hesson, David P., to Du Pont de Nemours, E. I., and Company. Phenylquinazolinecarboxylic acids and derivatives as cancer chemotherapeutic agents. 4,639,454, Cl. 514-259.000.

Heubach, Gunther; Bauer, Klaus; and Bieringer, Hermann, to Hoechst Aktiengesellschaft. Plant protection agents based on 1,2,4-triazole derivatives and also new derivatives of 1,2,4-triazole. 4,639,266, Cl. 71-92.000.

Hewlett-Packard Company: *See*—
Baldwin, Gary; Hallgren, Robert B.; Hornak, Thomas; and Ives, Fred H., 4,639,619, Cl. 307-352.000.

Heymer, Gero: *See*—
Elsner, Georg; Staendeke, Horst; and Heymer, Gero, 4,639,331, Cl. 252-609.000.

Heywood, R. G.: *See*—
Clark, Gary E., 4,638,997, Cl. 273-1.0GD.

Higashi, Kanji, to Kabushiki Kaisha Bandai. Safety razor. 4,638,560, Cl. 30-47.000.

High Resolution Television, Inc.: *See*—
Schine, Jonathan M., 4,639,766, Cl. 358-21.00R.

Higuchi, Shinsuke: *See*—
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.

Hikino, Keiji: *See*—
Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, 4,638,573, Cl. 34-82.000.

Hilbrans, Hermann; Gamroth, Michael; Melcher, Gerhard; and Megerle, Friedrich, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for the reducing treatment of molten metals and/or slags thereof. 4,639,269, Cl. 75-76.000.

Hill, Francis K. Remote control multi-position rear view mirror. 4,639,103, Cl. 350-636.000.

Hill, William H.: *See*—
Valenty, Vivian B.; Hill, William H.; and Ravi, Prasad S., 4,639,325, Cl. 252-89.100.

Hilligoss, Lawrence O.: *See*—
Butler, Myron C.; Hilligoss, William R.; and Hilligoss, Lawrence O., 4,639,557, Cl. 379-29.000.

Hilligoss, William R.: *See*—
Butler, Myron C.; Hilligoss, William R.; and Hilligoss, Lawrence O., 4,639,557, Cl. 379-29.000.

Hilt, Albrecht: *See*—
Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, 4,639,488, Cl. 524-456.000.

Hilti Aktiengesellschaft: *See*—
Kousek, Heinz, 4,638,870, Cl. 173-12.000.

Hilton-Davis Chemical Company, The: *See*—
Hung, William M.; and Ehlinger, Edward E., 4,639,750, Cl. 346-221.000.

Hinton, George F., to United States of America, Navy. Superconducting conductivity anomaly detection system. 4,639,675, Cl. 324-334.000.

Hirai, Hiroyuki: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,639,418, Cl. 430-617.000.

Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, to Kuraray Co., Ltd. Process for producing polyester polyurethane. 4,639,471, Cl. 521-172.000.

Hirai, Masatake: *See*—
Tanaka, Kazuhiro; Yamamoto, Yasuo; Hanaoka, Katsumi; and Hirai, Masatake, 4,639,707, Cl. 336-185.000.

Hiraiwa, Kazuyoshi, to Nissan Motor Co., Ltd. Planetary gear train for automotive transmission or the like. 4,638,688, Cl. 74-763.000.

Hirayama, Chikara; and Andrew, Kenneth F., to North American Philips Corporation. High-pressure sodium vapor lamp and ternary amalgam therefor. 4,639,639, Cl. 313-639.000.

Hirayama, Makoto: *See*—
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.

Hirayama, Shoji; and Inada, Mitsuharu, to Sony Corporation. Cordless telephone. 4,639,549, Cl. 379-62.000.

Hirosaki, Botaro; and Tanaka, Osamu, to NEC Corporation. Apparatus for cancelling periodic carrier phase jitters. 4,639,939, Cl. 375-118.000.

Hirose Electric Co., Ltd.: *See—*
Kikuta, Sigeru, 4,639,067, Cl. 339-143.00R.

Hirose, Haruki: *See—*
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.

Hirota, Akira; and Tsuruta, Masahiko, to Victor Company of Japan, Ltd. Combination of reproducing heads and a rotary transformer device. 4,639,805, Cl. 360-108.000.

Hirotomi, Hajime: *See—*
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Hitachi, Ltd.: *See—*
Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; Tajima, Fumio; and Tomite, Tosio, 4,639,625, Cl. 310-154.000.
Ejiri, Yuuki; Ito, Tomoo; Tsuruta, Hisato; and Kamifuji, Hiroshi. 4,639,624, Cl. 310-154.000.
Hashimoto, Masahiro; Watanabe, Tsuyoshi; and Wada, Kenichi, 4,639,886, Cl. 364-736.000.
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,638,646, Cl. 62-478.000.
Moribe, Yoshihiro; Hayashi, Yukitaka; Maekawa, Hideo; and Tsukui, Kunitsugu, 4,639,804, Cl. 360-105.000.
Nakamura, Ichiro, 4,638,718, Cl. 91-178.000.
Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, 4,638,573, Cl. 34-82.000.
Ohta, Jiro, 4,639,190, Cl. 415-129.000.
Sakazume, Akio; Yoshikawa, Hiroki; and Matsushima, Hiroaki, 4,638,643, Cl. 62-209.000.
Sekizawa, Sadao; Seki, Toshio; and Takahashi, Tadashi, 4,639,807, Cl. 360-113.000.
Shimizu, Isao, 4,639,757, Cl. 357-36.000.
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.
Wada, Hideo; and Goto, Humio, 4,639,862, Cl. 364-200.000.
Watanabe, Kazuo; and Sato, Tetsuo, 4,639,795, Cl. 360-62.000.
Yamamoto, Shigehiko, 4,639,377, Cl. 427-10.000.
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, 4,639,146, Cl. 384-99.000.

Hobo, Sumiya: *See—*
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Hoechst Aktiengesellschaft: *See—*
Elsner, Georg; Staendeke, Horst; and Heymer, Gero, 4,639,331, Cl. 252-609.000.
Grau, Ulrich, 4,639,332, Cl. 530-303.000.
Heubach, Gunther; Bauer, Klaus; and Bieringer, Hermann, 4,639,266, Cl. 71-92.000.
Obermeier, Rainer; Geiger, Rolf; and Grau, Ulrich, 4,639,333, Cl. 530-303.000.
Rosner, Manfred; Loewe, Heinz; Duwel, Dieter; and Kirsch, Reinhard, 4,639,463, Cl. 514-395.000.
Staab, Rudolf; Bergner, Dieter; and Hannesen, Kurt, 4,639,303, Cl. 204-258.000.
Stahlhofen, Paul, 4,639,406, Cl. 430-165.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,639,443, Cl. 514-222.000.
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,639,446, Cl. 514-222.000.

Hoet, Roger; and Gerlach, Pierre, to Thomson-CSF. Electron tube with cathode cooling device. 4,639,633, Cl. 313-35.000.

Hoey, George B., to Mallinckrodt, Inc. Methods and compositions for enhancing magnetic resonance imaging. 4,639,364, Cl. 424-9.000.

Hofer, Peter: *See—*
Shetty, Bola V.; McFadden, Arthur; and Hofer, Peter, 4,639,529, Cl. 548-550.000.

Hoffarth, Gunther: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.

Hoffmann-La Roche Inc.: *See—*
Borer, Claude; and Greter, Andreas, 4,639,135, Cl. 356-246.000.

Hoffmann, Ulrich: *See—*
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.

Hofmann, Hans: *See—*
Wenger, Roland; Traber, Rene P.; Kobel, Hans; and Hofmann, Hans, 4,639,434, Cl. 514-11.000.

Hofmann, Manfred: *See—*
Leverberg, Siegfried; and Hofmann, Manfred, 4,638,668, Cl. 73-866.500.

Hogan, Thomas C.; and Adelman, Arnold, to Prime Computer, Inc. Data transmission signal apparatus. 4,639,936, Cl. 375-36.000.

Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, to Bayer Aktiengesellschaft. Cross-linkable polymer resins and use thereof as binders for coating agents. 4,639,499, Cl. 526-285.000.

Hollinden, David E.: *See—*
Tamer, Gregory G.; and Hollinden, David E., 4,639,786, Cl. 358-197.000.

Holmwood, Graham: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.

Holonyak, Nick, Jr., to University of Illinois, The Board of Trustees of The. Forming disordered layer by controlled diffusion in heterojunction III-V semiconductor. 4,639,275, Cl. 148-1.500.

Holt, Andrew; Cheek, Martin G.; and Clegg, Ernest N., to UOP Limited. Oxidation catalysts. 4,639,432, Cl. 502-324.000.

Holtey, Thomas O.: *See—*
Murray, Thomas L., Jr.; and Holtey, Thomas O., 4,639,858, Cl. 364-200.000.

Honda, Chika; Suzuki, Akio; Machida, Katsutoshi; and Iwata, Masatoshi, to Konishiroku Photo Industry Co., Ltd. Silver halide X-ray photosensitive material. 4,639,417, Cl. 430-567.000.

Honda Giken Kogyo K.K.: *See—*
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,639,713, Cl. 340-63.000.
Otobe, Yutaka, 4,638,658, Cl. 73-117.300.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Morioka, Minoru; Kishi, Toshiaki; and Yoshioka, Toshiharu, 4,638,881, Cl. 180-219.000.
Nishimura, Sadanori, 4,638,897, Cl. 192-3.300.
Otobe, Yutaka; Kiuchi, Takeo; and Tomozawa, Kikuo, 4,639,870, Cl. 364-431.050.
Sasaki, Kiichi; and Takashi, Iimuro, 4,638,534, Cl. 24-683.000.
Shimizu, Yasuo, 4,639,651, Cl. 318-432.000.

Honda Tsushin Kogyo Kabushiki Kaisha: *See—*
Shimamiya, Yukio; Narumo, Kinzo; and Ebihara, Hiroshi, 4,639,066, Cl. 339-132.00B.

Honeycutt, Thomas E.: *See—*
Roberts, Thomas G.; and Honeycutt, Thomas E., 4,639,642, Cl. 315-39.000.

Honeywell Inc.: *See—*
Hegg, Jeffrey W., 4,639,658, Cl. 323-204.000.
Koets, Howard, 4,639,709, Cl. 337-360.000.

Honeywell Information Systems Inc.: *See—*
Murray, Thomas L., Jr.; and Holtey, Thomas O., 4,639,858, Cl. 364-200.000.
Peters, Arthur, 4,639,860, Cl. 364-200.000.

Hongo, Takayasu: *See—*
Mori, Tohru; Hongo, Takayasu; and Kamikura, Rinzo, 4,639,751, Cl. 346-227.000.

Hood, Rush W., Jr.: *See—*
Ramsey, Maynard, III; Medero, Richard; and Hood, Rush W., Jr., 4,638,810, Cl. 128-681.000.

Hope, Jimmie L. Door lock. 4,639,021, Cl. 292-7.000.

Hoppe, Joachim: *See—*
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,639,585, Cl. 235-492.000.

Hoppmanns, Rolf D.; Steup, Walter; Wieczorek, Willibald; and Beitler, Franz, to U.S. Philips Corporation. Loading mechanism for a magnetic tape cassette apparatus. 4,639,801, Cl. 360-96.500.

Hopwood, Francis W.; Caldwell, Stephen P.; and Decker, Martin J., to United States of America, Air Force. Wide-band phase locked loop amplifier apparatus. 4,639,688, Cl. 331-10.000.

Hori, Yoshiaki: *See—*
Ogawa, Yutaka; Ogasawara, Takayuki; and Hori, Yoshiaki, 4,638,683, Cl. 74-567.000.

Horishita, Sumio: *See—*
Matsunobu, Akira; Horishita, Sumio; and Yamada, Tetsuo, 4,639,374, Cl. 426-43.000.

Horn, Berthold K. P.: *See—*
Day, Chia P.; Krause, Kenneth W.; Whitcomb, Louis L.; and Horn, Berthold K. P., 4,639,878, Cl. 364-513.000.

Hornak, Thomas: *See—*
Baldwin, Gary; Hallgren, Robert B.; Hornak, Thomas; and Ives, Fred H., 4,639,619, Cl. 307-352.000.

Horvath, Janos: *See—*
Bader, Imre; Berecz, Endre; Szina, Gabor; and Horvath, Janos, 4,639,304, Cl. 204-413.000.

Hosaka, Masato: *See—*
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, 4,639,208, Cl. 431-1.000.

Hoshiai, Takao: *See—*
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Hosoi, Atsushi: *See—*
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.

Hotai, Kazuhide: *See—*
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.

Hou, Kenneth C.; and Cogswell, Garrett, to Cuno Inc. Intravenously injectable immunoglobulin G (IGG) and method for producing same. 4,639,513, Cl. 530-387.000.

Hounsfield, Godfrey N., to EMI Limited. Radiography. 4,639,941, Cl. 378-11.000.

Hovey, Leonard L.; Mathews, Marion J., III; and Peoples, P. Robert, to Monsanto Company. Dimerization process improvements. 4,639,539, Cl. 558-363.000.

Howard, Darryl A.; and Shen, Lawrence Y. L., to Lockheed Missiles & Space Company, Inc. Pulsed electromagnetic nondestructive test method for determining volume density of graphite fibers in a graphite-epoxy composite material. 4,639,669, Cl. 324-239.000.

Howe, Dwayne E.: *See*—
Furlong, James J.; and Howe, Dwayne E., 4,639,824, Cl. 361-179.000.

Howe, Milton A., Jr., to W. R. Grace & Co., Cryovac Div. Multiply package having delaminating easy open seal. 4,638,913, Cl. 206-632.000.

Howell, Edward K.; and Anderson, Thomas E., to General Electric Company. Steering logic circuit for a digital data transceiver. 4,639,933, Cl. 375-8.000.

Howie, Peter W.; and McNeilly, Alan, to Societe d'Etudes Scientifiques et Industrielles de l'Ile de France. Contraceptive composition. 4,639,439, Cl. 514-171.000.

Hrustich, John; and Sitler, Wayne R., to International Business Machines Corporation. Dual stream processor apparatus. 4,639,856, Cl. 364-200.000.

Huang, Leeyuan; and Lam, Y. K. Tony, to Merck & Co., Inc. 3',6-diisopentenyl-2',4'-dihydroxy-5,7-dimethoxy-isoflavan and related compounds useful as anxiolytic agents and avermectin antidotes. 4,639,466, Cl. 514-456.000.

Hubbard, Robert P. Neck protection device with occupant of a high performance vehicle. 4,638,510, Cl. 2-6.000.

Huber, Robert: *See*—
Weddigen, Gerd; Huber, Robert; Schmidt, Birgit; and Schneider, Hartmut, 4,639,496, Cl. 525-506.000.

Hudspeth, William, to Polaroid Corporation. Optical accessory for photographic apparatus. 4,639,109, Cl. 354-295.000.

Huesman, Edward H., to General Motors Corporation. Windshield wiper ball joint. 4,639,160, Cl. 403-71.000.

Huggins, Raymond W.; and Shoemaker, Ralph A., to Xerox Corporation. Feedability sensor for a vacuum corrugated feeder. 4,638,986, Cl. 271-98.000.

Hughes Aircraft Company: *See*—
Leyden, Richard N.; and Lawrence, Robert, 4,639,290, Cl. 156-644.000.

Huguet, Jean-Gerard; and Jaussely, Bernard, to Institut National de la Recherche Agronomique. Process and apparatus for automatically controlling the irrigation of plants. 4,638,594, Cl. 47-1.00R.

Huignard, Jean-Pierre; Malard, Marcel; and de Corlieu, Guy, to Thomson-CSF. Static deflector device for an infrared beam. 4,639,091, Cl. 350-347.00V.

Hullein, Francois; and Fribault, Gerard, to Societe d'Etudes, Recherche et Constructions Electroniques-Sercel. Method of measuring distance between two observation points. 4,639,129, Cl. 356-5.000.

Hume, David W.: *See*—
Amelio, William J.; Hume, David W.; McBride, Donald G.; and Rickert, Robert G., 4,639,380, Cl. 427-97.000.

Hung, William M.; and Ehlinger, Edward E., to Hilton-Davis Chemical Company, The. Fluoran compounds and marking systems. 4,639,750, Cl. 346-221.000.

Hunt, Ann H.; Molloy, R. Michael; Nagarajan, Ramakrishnan; and Schabel, Amelia A., to Eli Lilly and Company. Glycopeptide derivatives. 4,639,433, Cl. 514-8.000.

Hunt, David G.: *See*—
Green, John G.; and Hunt, David G., 4,639,472, Cl. 522-107.000.

Hunt, Robert D.: *See*—
Neumann, David B.; and Hunt, Robert D., 4,638,591, Cl. 43-89.000.

Hurst, Robert N., to RCA Corporation. Apparatus for detecting motion in a video image by comparison of a video line value with an interpolated value. 4,639,773, Cl. 358-105.000.

Huttenen, Jouko: *See*—
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,514, Cl. 536-30.000.

Huttunen, Jouko: *See*—
Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,515, Cl. 536-30.000.

Hydro-Quebec: *See*—
Lalancette, Jean-Marc; and Belanger, Germain, 4,639,309, Cl. 208-262.000.

Hydrotechnik GmbH: *See*—
Leverberg, Siegfried; and Hofmann, Manfred, 4,638,668, Cl. 73-866.500.

Hydrotile Machinery Company: *See*—
Adly, Tarek A., 4,639,342, Cl. 264-40.100.

Ibe, Rebecca C. Attachable eye for dolls. 4,639,235, Cl. 446-389.000.

Ichihara, Takashi, to Kabushiki Kaisha Toshiba. Ring type single-photon emission CT imaging apparatus. 4,639,599, Cl. 250-363.00S.

Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, to NEC Corporation. Radio communication apparatus disabled on reception of a predetermined signal. 4,639,726, Cl. 340-825.440.

ICI Americas Inc.: *See*—
Payne, Earl R., 4,639,716, Cl. 340-571.000.

ICI Australia Limited: *See*—
Farquharson, Graeme J.; Watson, Keith G.; and Bird, Graham J., 4,639,267, Cl. 71-98.000.

Ide, Fumito; and Mochizuki, Hidenori, to Kabushiki Kaisha Toshiba. Image-forming apparatus with automatic and manual paper feed modes. 4,639,114, Cl. 355-35.00H.

Ide, Toshiaki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; and Arioka, Hiroyuki, 4,639,389, Cl. 428-141.000.

Idigkeit, Werner; Kurr, Klaus; and Ticks, Gerd-Heinz, to Carl Freudenberg, Firma. Apparatus for resiliently mounting a vibrating body. 4,638,983, Cl. 267-140.100.

Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, to Inax Corporation; and Japan Alpha Corporation. Decorative panels comprising replaceable decorative sheets. 4,638,618, Cl. 52-509.000.

Ife, Robert J.: *See*—
Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., 4,639,519, Cl. 544-320.000.

Igarashi, Toshiji: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.

Iigima, Kouta, to Alps Electric Co., Ltd. Oscillator. 4,639,691, Cl. 331-99.000.

Iijima, Shiro: *See*—
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.

Iino, Kimio: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, 4,639,441, Cl. 514-195.000.

Iizuka, Hajime: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.

Iizuka, Tetsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Metal oxide semiconductor field-effect transistor with metal source making ohmic contact to channel-base region. 4,639,758, Cl. 357-42.000.

Ikawa, Yasuo; Kawakyu, Katsue; and Kameyama, Atushi, to Kabushiki Kaisha Toshiba. Gallium arsenide gate array integrated circuit including DCFL NAND gate. 4,639,621, Cl. 307-450.000.

Ikeda, Hidetsugu: *See*—
Matsui, Shingo; Ikeda, Hidetsugu; Era, Akio; and Nishimura, Sanji, 4,639,355, Cl. 423-112.000.

Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, to Fujitsu Limited. Beam scanning type information readout device. 4,639,070, Cl. 350-3.710.

Ikeda, Hiroyuki: *See*—
Matsumoto, Seikichi; and Ikeda, Hiroyuki, 4,639,071, Cl. 350-3.710.

Ikeda, Kinjiro: *See*—
Kamei, Noboru; Ikeda, Kinjiro; Aoyama, Keishi; and Hamano, Seitaro, 4,639,294, Cl. 203-88.000.

Ikeda Mohando Co., Ltd.: *See*—
Nohara, Fujio; and Fujinawa, Tomoaki, 4,639,523, Cl. 546-209.000.

Ikeda, Sakio, to Dynic Corporation; and Mine Kinzoku Kogyo Kabushiki Kaisha. Device for decreasing side stream smoke of tobacco products. 4,638,819, Cl. 131-331.000.

Ikeda, Shinji, to Toyota Jidosha Kabushiki Kaisha. Method of and apparatus for controlling vacuum modulating valve for exhaust gas recirculation control. 4,638,784, Cl. 123-571.000.

Ikeda, Yutaka: *See*—
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.

Ikegaya, Kouji: *See*—
Fujii, Setsuro; Yokoyama, Touru; Ikegaya, Kouji; Yokoo, Nobuo; and Nagakura, Masahiko, 4,639,435, Cl. 514-11.000.

Ikemori, Keiji: *See*—
Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,639,096, Cl. 350-427.000.

Ikenoue, Yoshikazu: *See*—
Johdai, Akiyoshi; Yamada, Hirokazu; Ikenoue, Yoshikazu; and Ishikawa, Takuma, 4,638,992, Cl. 271-293.000.

Illustrato, Vito J. Spring heel for shoe and the like. 4,638,575, Cl. 36-38.000.

Imada, Kiyoshi: *See*—
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.

Imai, Akio; Okamoto, Yasushi; and Saito, Masatoshi, to Sumitomo Chemical Company, Limited. Process for producing polystyrene. 4,639,494, Cl. 525-271.000.

Imai, Kiyoshi: *See*—
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.

Imai, Shigeru: *See*—
Akiyama, Hideki; and Imai, Shigeru, 4,638,542, Cl. 29-408.000.

Imanaka, Asaji, to Nippon Air Brake Co., Ltd. Railway vehicle brake system with improved blending control of pneumatic and electric brakes. 4,639,047, Cl. 303-15.000.

Imaoka, Kanya: *See*—
Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, 4,638,624. Cl. 57-208.000.

Inabe, Mitsuharu; Sekiguchi, Takashi; Yoneyama, Yoshio; and Suzuki, Tadashi, to Fuji Jukogyo Kabushiki Kaisha. Crane device installed in cargo transporting vehicle. 4,639,182, Cl. 414-543.000.

Inada, Mitsuharu: *See*—
Hirayama, Shoji; and Inada, Mitsuharu, 4,639,549, Cl. 379-62.000.

Inada, Tomohide: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Inagaki, Nobuo: *See*—
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.
Inagaki, Takefumi: *See*—
Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.
Inai, Yuichi: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.
Inax Corporation: *See*—
Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, 4,638,618, Cl. 52-509.000.
Inco Alloys International, Inc.: *See*—
Shoemaker, Lewis E.; and Bates, Thomas O., 4,639,576, Cl. 219-146.230.
Independent Broadcasting Authority: *See*—
Morcom, Richard, 4,639,764, Cl. 358-14.000.
Inductotherm Industries, Inc.: *See*—
Mortimer, John H., 4,639,931, Cl. 373-138.000.
Ingersoll-Rand Company: *See*—
Kirkland, Thomas R., Jr., 4,639,196, Cl. 417-228.000.
Inoue Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,639,378, Cl. 427-35.000.
Inoue, Kazuo: *See*—
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.
Inoue, Kiyoshi, to Inoue Japax Research Incorporated. Auto-selective metal deposition on dielectric surfaces. 4,639,378, Cl. 427-35.000.
Inoue, Nobuhiro: *See*—
Fushiya, Fusao; Hakamata, Nobuo; Abe, Hiroyuki; and Inoue, Nobuhiro, 4,638,700, Cl. 83-467.00R.
Inoue, Nobuo: *See*—
Hattori, Yoshihisa; and Inoue, Nobuo. 4,639,771, Cl. 358-80.000.
Inoue, Osamu, to Victor Company of Japan, Ltd. Magnetic tape recording and reproducing apparatus with rotatable drum having inclined heads. 4,639,799, Cl. 360-85.000.
Inoue, Takashi, to Ricoh Company, Ltd. Block-divided driving of a thermal printhead. 4,639,741, Cl. 346-76.0PH.
Inoue, Yoshikazu: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,639,448, Cl. 514-226.000.
Inouye, Hiroshi: *See*—
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, 4,639,146, Cl. 384-99.000.
Institut Cerac S. A.: *See*—
Hartwig, Carl S. M., 4,639,645, Cl. 318-51.000.
Institut Francais du Petrole: *See*—
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,639,354, Cl. 422-140.000.
Institut National de la Recherche Agronomique: *See*—
Huguet, Jean-Gerard; and Jaussely, Bernard, 4,638,594, Cl. 47-1.00R.
Institute of Critical Care Medicine: *See*—
Bisera, Jose; Carrington, James H.; and Weil, Max H., 4,638,811, Cl. 128-673.000.
Intelligent Storage Inc.: *See*—
Kersbergen, Mark D., 4,639,054, Cl. 339-14.00R.
Intermedicat GmbH: *See*—
Kahlert, Wolfgang; Klein, Joachim; Steinert, Hans-Jurgen; and Vorlop, Claus, 4,639,423, Cl. 435-287.000.
International Business Machines Corporation: *See*—
Amelio, William J.; Hume, David W.; McBride, Donald G.; and Rickert, Robert G., 4,639,380, Cl. 427-97.000.
Bushaw, Kenneth A.; Bustamante, Louis A.; and McCurry, James J., 4,639,126, Cl. 355-3.0SH.
Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., 4,639,919, Cl. 371-27.000.
Chu, Richard C., 4,638,858, Cl. 165-185.000.
Goodwin, John J.; and Lu, Nicky C., 4,639,622, Cl. 307-482.000.
Gruzman, Boris; and Nilsen, Carl-Otto, 4,639,572, Cl. 219-121.0LG.
Hrustich, John; and Sitler, Wayne R., 4,639,856, Cl. 364-200.000.
Neubauer, Jerry L.; Schmidt, Laurence J.; and Voss, Steven H., 4,639,802, Cl. 360-98.000.
Ostergren, Carl D.; and Paivanas, John A., deceased, 4,639,829, Cl. 361-386.000.
Schlig, Eugene S.; and Chamberlain, Savvas G., 4,639,678, Cl. 324-457.000.
International Computers Limited: *See*—
Boughton, Geoffrey J., 4,639,723, Cl. 340-799.000.
Loo, Johnson, 4,639,866, Cl. 364-200.000.
Martin, Michael W., 4,639,865, Cl. 364-200.000.
International Exide Electronics/Corporation: *See*—
Noworolski, Zbigniew; and Ferens, Jerzy, 4,639,849, Cl. 363-56.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; and Hanna, Marie R., 4,639,330, Cl. 252-522.00R.
International Minerals & Chemical Corp.: *See*—
Michalski, Dennis H.; and Srinivasan, Viswanathan, 4,639,359, Cl. 423-321.00R.
International Rectifier Corporation: *See*—
Nilarp, Anders, 4,638,553, Cl. 29-580.000.
Intersil, Inc.: *See*—
Doluca, Tunc, 4,639,715, Cl. 340-347.0AD.
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, to Matsushita Electric Industrial Co., Ltd. Pulse combustion apparatus with a plurality of pulse burners. 4,639,208, Cl. 431-1.000.
Inventio AG: *See*—
Lunardi, Gerhard, 4,638,901, Cl. 198-323.000.
Investment Rarites, Incorporated: *See*—
Burandt, Corliss O., 4,638,772, Cl. 123-90.600.
Iris Graphics, Inc.: *See*—
Jochimsen, Dieter, 4,639,736, Cl. 346-75.000.
Isaacson, Jerry. Removable lightweight roof opening covers for vehicles. 4,639,035, Cl. 296-218.000.
Isaka, Kazuo, to Canon Kabushiki Kaisha. Process kit and an image formation apparatus using the process kit. 4,639,119, Cl. 355-3.0DD.
ISC Technologies, Inc.: *See*—
Farmer, James R., 4,638,736, Cl. 102-393.000.
Ishigure, Kazuaki, to Omron Tateisi Electronics Co. Device for automatically opening and closing cash container. 4,638,746, Cl. 109-52.000.
Ishiguro, Michihiro: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Ishihara, Masaki: *See*—
Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,638,690, Cl. 74-866.000.
Ishihara, Yasusuke: *See*—
Maeda, Kazuya; and Ishihara, Yasusuke, 4,639,004, Cl. 280-5.320.
Ishii, Chiharu, to Fuji Xerox Co., Ltd. Data transferring method. 4,639,894, Cl. 365-189.000.
Ishii, Daisuke: *See*—
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.
Ishii, Masao: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Ishikawa, Mamoru: *See*—
Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, 4,639,743, Cl. 346-76.0PH.
Ishikawa, Takuma: *See*—
Johdai, Akiyoshi; Yamada, Hirokazu; Ikenoue, Yoshikazu; and Ishikawa, Takuma, 4,638,992, Cl. 271-293.000.
Ishikawa, Yoshihiro: *See*—
Ueki, Takashi; and Ishikawa, Yoshihiro, 4,638,789, Cl. 126-351.000.
Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Wada, Hidekazu, 4,639,699, Cl. 333-202.000.
Isogai, Masaki; and Kawahara, Atsushi, to Kyodo News Service; and Nippon Kogaku K. K. Image-scanning apparatus. 4,639,787, Cl. 358-214.000.
Issledovatelski Centar "Tekom" : *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.
Isuzu Motors Limited: *See*—
Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,638,690, Cl. 74-866.000.
Ito, Ken: *See*—
Kawai, Akio; Ito, Ken; and Iwamoto, Hideo, 4,639,676, Cl. 324-380.000.
Ito, Masashi; Ohashi, Toshio; and Ui, Katsumi, to Toyo Ink Mfg., Co., Ltd.; and Toyoto Jidosha Kabushiki Kaisha. Liquid colorant for ABS resins. 4,639,272, Cl. 106-243.000.
Ito, Tomoo: *See*—
Ejiri, Yuuki; Ito, Tomoo; Tsuruta, Hisato; and Kamifuji, Hiroshi, 4,639,624, Cl. 310-154.000.
Ito, Toshohiko: *See*—
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.
Ito, Yoshinobu: *See*—
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.
Ito, Yoshio, to Canon Kabushiki Kaisha. Printing apparatus. 4,639,749, Cl. 346-153.100.
Itoh, Toyotsugu; and Muramatsu, Toshio, to Konishiroku Photo Industry Co., Ltd. Optical beam scanning apparatus including a cylindrical lens having its opposite ends closer to the scanned plane than its medial portion. 4,639,072, Cl. 350-6.800.
ITT Corporation: *See*—
Beery, Jack; and Broome, Barry G., 4,639,127, Cl. 355-35.000.
Muzslay, Steven Z., 4,639,061, Cl. 339-59.00M.
Toegel, Herbert J.; Yudichak, Joseph R.; and Gilsdorf, John F., 4,639,910, Cl. 370-58.000.
Iuchi, Akira; and Tsunokawa, Shinya, to Osaka Gas Company Limited. Fluid coupler. 4,638,975, Cl. 251-149.600.
Iura, Takao: *See*—
Shiki, Kazuhiro; and Iura, Takao, 4,638,781, Cl. 123-493.000.
Ives, Fred H.: *See*—
Baldwin, Gary; Haligren, Robert B.; Hornak, Thomas; and Ives, Fred H., 4,639,619, Cl. 307-352.000.

Iwahashi, Hiroshi; and Ochii, Kiyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,639,895, Cl. 365-200.000.

Iwamoto, Hideo: *See—*
Kawai, Akio; Ito, Ken; and Iwamoto, Hideo, 4,639,676, Cl. 324-380.000.

Iwasa, Koji: *See—*
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,639,088, Cl. 350-339.00F.

Iwasa, Tadanobu: *See—*
Sugita, Hiroshi; Iwasa, Tadanobu; Yasukawa, Takemasa; and Aritake, Masanori, 4,638,525, Cl. 15-250.360.

Iwata, Masatoshi: *See—*
Honda, Chika; Suzuki, Akio; Machida, Katsutoshi; and Iwata, Masatoshi, 4,639,417, Cl. 430-567.000.

Iwata, Tetsuya, to Alps Electric Co., Ltd. Magnetic head. 4,639,809, Cl. 360-121.000.

Iyoda, Motomi, to Toyota Jidosha Kabushiki Kaisha. Sensor for detecting an amount of rain. 4,639,831, Cl. 361-286.000.

Izuhara, Katsuhiro: *See—*
Kobayashi, Hisamine; and Izuhara, Katsuhiro, 4,638,600, Cl. 51-164.200.

Izumi, Hideki: *See—*
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, 4,639,146, Cl. 384-99.000.

Izumi, Kazuyoshi: *See—*
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.

Izumi, Masayuki: *See—*
Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, 4,638,618, Cl. 52-509.000.

Izumida, Teruo: *See—*
Yamanaka, Yasutoshi; Ageishi, Kazunobu; and Izumida, Teruo, 4,638,856, Cl. 165-119.000.

J. I. Case Company: *See—*
Albrecht, Allan, 4,638,680, Cl. 74-516.000.

Jaccod, Michel, to Valeo. Variable speed drive pulley. 4,639,238, Cl. 474-8.000.

Jaccod, Michel: *See—*
Thirion de Briel, Jacques; and Jaccod, Michel, 4,639,239, Cl. 474-8.000.

Jackovitz, John F.; and Kunkle, Richard P., to United States of America, Energy. Surfactant addition to phosphoric acid electrolyte. 4,639,401, Cl. 429-30.000.

Jacob-Grinschgl, Wolfgang; and Muller, Udo. Marking device for use with inductive measuring sensor. 4,639,547, Cl. 178-18.000.

Jagenberg Ag: *See—*
Buschmann, Gerhard; and Muller, Georg, 4,638,657, Cl. 73-78.000.

Jalaguier, Jean-Pierre: *See—*
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,639,284, Cl. 156-213.000.

James, Barry R., to Merkle Engineers, Inc. Refractory curtain wall. 4,638,617, Cl. 52-474.000.

Jamet, Claude: *See—*
Dabat, Robert; and Jamet, Claude, 4,639,178, Cl. 413-26.000.

Jankowski, Alfons: *See—*
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.

Janome Sewing Machine Co., Ltd.: *See—*
Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,638,751, Cl. 112-254.000.

Japan Alpha Corporation: *See—*
Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, 4,638,618, Cl. 52-509.000.

Japan Tobacco, Inc.: *See—*
Okumoto, Yutaka, 4,638,817, Cl. 131-280.000.

Jaqua, Vance W.; and Jencek, Premysl, to Rockwell International Corporation. Pneumatic bag deployment of folded nozzle extensions. 4,638,947, Cl. 239-265.430.

Jarnagin, William S. Recyclotron III, a recirculating plasma fusion system. 4,639,348, Cl. 376-107.000.

Jarnestedt, Goran; and von Campenhausen, Rolf, to Telefonaktiebolaget LM Ericsson. Apparatus for correcting frequency-dependent attenuation of the transmitting medium in signal transmission. 4,639,935, Cl. 375-11.000.

Jaugey, Bernard: *See—*
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,639,284, Cl. 156-213.000.

Jaussely, Bernard: *See—*
Huguet, Jean-Gerard; and Jaussely, Bernard, 4,638,594, Cl. 47-1.00R.

Jayaraman, Rajsekhar: *See—*
Singer, Barry M.; and Jayaraman, Rajsekhar, 4,639,761, Cl. 357-234.000.

Jean Walterscheid GmbH: *See—*
Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, 4,639,163, Cl. 403-322.000.
Geisthoff, Hubert; Buthe, Theo; and Mikeska, Felix, 4,639,162, Cl. 403-316.000.

Jegousse, Michel J.: *See—*
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel J.; and Kaluszynski, Michel, 4,638,984, Cl. 269-43.000.

Jencek, Premysl: *See—*
Jaqua, Vance W.; and Jencek, Premysl, 4,638,947, Cl. 239-265.430.

Jensen, Tom M., to Boeing Company, The. Airborne folding wheelchair. 4,639,012. Cl. 280-642.000.

Jester, William A.: *See—*
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.

Jewusiak, Stephen J., to Ethicon, Inc. Double-latched non-metallic, bio-compatible hemostatic clip. 4,638,804, Cl. 128-325.000.

Jezzi, Arrigo D.: *See—*
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., 4,639,254, Cl. 604-385.00R.

Jing Tech, Inc.: *See—*
Cheng, Wei-Tsang, 4,639,153, Cl. 400-202.100.

Jochimsen, Dieter, to Iris Graphics, Inc. Ink jet recorder. 4,639,736, Cl. 346-75.000.

Jodel Associates, Inc.: *See—*
Eldridge, John D., Jr., 4,638,681, Cl. 74-544.000.

Johdai, Akiyoshi; Yamada, Hirokazu; Ikenoue, Yoshikazu; and Ishikawa, Takuma, to Minolta Camera Kabushiki Kaisha. Sorting apparatus. 4,638,992, Cl. 271-293.000.

Johnson, Alan, to British Gas Corporation. Coupling devices for use with electrofusion fittings of thermoplastic material. 4,639,580, Cl. 219-541.000.

Johnson, Frederick O., to Westinghouse Electric Corp. Method and apparatus for firing angle control of series connected thyristor switches. 4,639,851, Cl. 363-164.000.

Johnson, Jesse F.: *See—*
Bell, Albert H., III; and Johnson, Jesse F., 4,639,194, Cl. 416-241.00B.

Johnson & Johnson Dental Products Company: *See—*
Jones, Robin M. F.; DeLuca, Robert D.; and Panzera, Carlino, 4,639,218, Cl. 433-8.000.

Johnson & Johnson Products, Inc.: *See—*
Dyer, John; Kennette, John W.; Bassett, Alton H.; and Hall, Stanley D., 4,639,253, Cl. 604-362.000.

Johnson, Lloyd D., to Standard-Knapp, Inc. Carton flap opener. 4,638,620, Cl. 53-382.000.

Johnson, Myron C.: *See—*
Check, John M.; and Johnson, Myron C., 4,639,568, Cl. 219-69.00M.

Johnson, Phil E.; and Brock, Robert K., to LTV Energy Products Company. Load bearing swab cup. 4,638,726, Cl. 92-241.000.

Johnson, Robert T.: *See—*
Bartlett, Lawrence D., 4,638,806, Cl. 128-400.000.

Johnson, Walter D.: *See—*
Hancock, Jack A.; Johnson, Walter D.; and Kennedy, Alan D., 4,639,347, Cl. 264-291.000.

Johnson, William M.; and Mere, Ilmar, to Ralph McKay Limited. Earth engaging implements. 4,638,868, Cl. 172-762.000.

Jolitz, William L.; and Williams, Richard A., to Ford Aerospace & Communications Corporation. High voltage high vacuum coating. 4,639,385, Cl. 427-386.000.

Jones, Gerald M., to National Research Development Corp. Fluid pressurized joint assembly. 4,639,158, Cl. 403-31.000.

Jones, James W.: *See—*
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.

Jones, Marvin R.; and Helfer, Paul E., to Koomey. Valve apparatus. 4,638,972, Cl. 251-1.300.

Jones, Ralph W. Pawl controlled reel extension. 4,638,959, Cl. 242-107.40R.

Jones, Robin M. F.; DeLuca, Robert D.; and Panzera, Carlino, to Johnson & Johnson Dental Products Company. Crystalline alumina orthodontic bracket. 4,639,218, Cl. 433-8.000.

Jones, Thomas P. H.: *See—*
Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., 4,639,545, Cl. 174-36.000.

Jordan, Larry B. Hydropneumatic cable tensioner. 4,638,978, Cl. 254-228.000.

Jose Guiblain, Helene Christiane, Cecile Helene Laurence Lacour, Laurent Pierre Rolland Lacour, heirs: *See—*
Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased, 4,639,452, Cl. 514-252.000.

Josef Gartner & Co.: *See—*
Papak, Viktor, 4,638,853, Cl. 165-50.000.

Jostens Learning Systems, Inc.: *See—*
Raymond, William J.; Morgan, Robert L.; and Miller, Ricky L., 4,639,877, Cl. 364-513.500.

Jouquey, Alain; Salmon, Jean; Mouren, Michel; and Touyer, Gaetan, to Roussel Uclaf. Novel radioactive estradienes labelled with iodine. 4,639,336, Cl. 260-397.500.

Jung, Eggert; and Klopsch, Siegfried, to Dr. Ing. Rudolf Hell GmbH. Method and circuit arrangement for simulating a multi-colored reproduction on a color monitor. 4,639,770, Cl. 358-76.000.

Jungbluth, Werner W.: *See—*
Rodloff, Rudiger K.; and Jungbluth, Werner W., 4,639,630, Cl. 310-328.000.

Junge, Jodo; Krause, Hans P.; Muller, Lutz; and Puls, Walter, to Bayer Aktiengesellschaft. Antidiabetic 3,4,5-trihydroxypiperidines. 4,639,436, Cl. 514-24.000.

Junkosha Company, Ltd.: *See—*
Suzuki, Hirosuke; Yasumoto, Hiromi; and Umemoto, Hiroshi, 4,639,693, Cl. 333-1.000.

Justusson, William M.: *See—*
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,638,846, Cl. 164-55.100.

Juzswik, David L.: *See*—
Floyd, William M.; and Juzswik, David L., 4,639,609, Cl. 307-10.00R.

Kabelitz, Hans-Peter: *See*—
Frings, Heinz; Kabelitz, Hans-Peter; and Ronthaler, Karl-Heinz, 4,639,199, Cl. 418-3.000.

KabiVitrum, Inc.: *See*—
Kirkland, W. Dean, 4,639,251, Cl. 604-260.000.

Kabushiki Kaisha Bandai: *See*—
Higashi, Kanji, 4,638,560, Cl. 30-47.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Namiki, Masayuki; Kamiya, Masaaki; Kojima, Yoshikazu; and Tanaka, Kojiro, 4,639,755, Cl. 357-28.000.
Wanibuchi, Hiroshi; and Kubota, Akira, 4,638,704, Cl. 83-628.000.

Kabushiki Kaisha Hikoma Seisakusho: *See*—
Kishi, Mitsuhiro, 4,638,887, Cl. 187-9.00R.

Kabushiki Kaisha Honda Rokku: *See*—
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,639,713, Cl. 340-63.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kitada, Tomowo, 4,638,779, Cl. 123-385.000.
Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, 4,638,845, Cl. 164-12.000.

Kabushiki Kaisha Kubota Tekkojo: *See*—
Wanibuchi, Hiroshi; and Kubota, Akira, 4,638,704, Cl. 83-628.000.

Kabushiki Kaisha Murakoshi Seiko: *See*—
Mazaki, Yoshiyuki, 4,639,161, Cl. 403-245.000.

Kabushiki Kaisha Nagaoka: *See*—
Uno, Masatoshi, 4,639,813, Cl. 360-128.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Kobayashi, Toshiji; and Matsumoto, Katsumi, 4,639,628, Cl. 310-194.000.

Kabushiki Kaisha Takuma: *See*—
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Kabushiki Kaisha Toshiba: *See*—
Fukuoka, Yoshitaka, 4,639,830, Cl. 361-411.000.
Hattori, Yoshihisa; and Inoue, Nobuo, 4,639,771, Cl. 358-80.000.
Ichihara, Takashi, 4,639,599, Cl. 250-363.00S.
Ide, Fumito; and Mochizuki, Hidenori, 4,639,114, Cl. 355-35.00H.
Ikawa, Yasuo; Kawakyu, Katsue; and Kameyama, Atushi, 4,639,621, Cl. 307-450.000.
Kurihara, Haruki; Sagara, Minoru; Matumoto, Kenji; and Tamura, Hideo, 4,639,925, Cl. 372-46.000.
Masuda, Eiji; and Fujita, Yasuhiko, 4,639,554, Cl. 340-365.00S.
O'Brien, Thomas P., 4,639,081, Cl. 350-144.000.
Sakai, Takami, 4,639,848, Cl. 363-51.000.
Shimbo, Masaru; Fukuda, Kiyoshi; and Ohwada, Yoshiaki, 4,638,552, Cl. 29-576.00J.
Suzuki, Motomu; and Asahina, Hiroshi, 4,639,867, Cl. 364-414.000.
Takahashi, Tomohiko, 4,639,742, Cl. 346-76.0PH.
Takeuchi, Seiji, 4,639,682, Cl. 329-50.000.
Tsutsumi, Teruo, 4,639,739, Cl. 346-76.0PH.

Kadokura, Kenji: *See*—
Kaneko, Yutaka; Kimura, Toshihiko; and Kadokura, Kenji, 4,639,415, Cl. 430-558.000.

Kafri, Oded: *See*—
Glatt, Ilana; Livnat, Aminadav; and Kafri, Oded, 4,639,132, Cl. 356-124.500.

Kahlert, Wolfgang; Klein, Joachim; Steinert, Hans-Jurgen; and Vorlop, Claus, to Intermedicat GmbH. Apparatus for the production of biocatalyst beads. 4,639,423, Cl. 435-287.000.

Kaire, Jean C., to Thomson-CSF. Regulated power supply circuit particularly for telephone set. 4,639,551, Cl. 323-231.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Pearson, Michael J., 4,639,259, Cl. 55-71.000.

Kaji, Shinichi: *See*—
Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, 4,638,573, Cl. 34-82.000.

Kakizawa, Haruo: *See*—
Tanaka, Kazuto; Kakizawa, Haruo; and Nagata, Kouichi, 4,639,099, Cl. 350-538.000.

Kakuta, Yoshiyuki: *See*—
Matsui, Fumio; Yanagisawa, Shuichi; Kakuta, Yoshiyuki; and Yoshizawa, Atsushi, 4,639,745, Cl. 346-135.100.

Kalck, Charles W., Sr.: *See*—
Capasso, Vincent; and Kalck, Charles W., Sr., 4,638,866, Cl. 169-90.000.

Kalck, Kathy: *See*—
Capasso, Vincent; and Kalck, Charles W., Sr., 4,638,866, Cl. 169-90.000.

Kaluszynski, Michel: *See*—
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel J.; and Kaluszynski, Michel, 4,638,984, Cl. 269-43.000.

Kamakari, Ryutaro: *See*—
Umemoto, Sumio; Hattori, Eiichi; and Kamakari, Ryutaro, 4,639,384, Cl. 427-290.000.

Kamal, Benjelloun. Stringed instrument. 4,638,708, Cl. 84-293.000.

Kamamori, Hitoshi: *See*—
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,639,088, Cl. 350-339.00F.

Kamei, Eiichi; and Namba, Hideaki, to Nippondenso Co., Ltd. Idle speed control apparatus for internal combustion engine. 4,638,778, Cl. 123-339.000.

Kamei, Noboru; Ikeda, Kinjiro; Aoyama, Keishi; and Hamano, Seitaro, to Daicel Chemical Industries, Ltd. Process for production sorbic acid. 4,639,294, Cl. 203-88.000.

Kameyama, Atushi: *See*—
Ikawa, Yasuo; Kawakyu, Katsue; and Kameyama, Atushi, 4,639,621, Cl. 307-450.000.

Kamifuji, Hiroshi: *See*—
Ejiri, Yuuki; Ito, Tomoo; Tsuruta, Hinato; and Kamifuji, Hiroshi, 4,639,624, Cl. 310-154.000.

Kamikura, Rinzo: *See*—
Mori, Tohru; Hongo, Takayasu; and Kamikura, Rinzo, 4,639,751, Cl. 346-227.000.

Kamiya, Joji: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.

Kamiya, Masaaki: *See*—
Namiki, Masayuki; Kamiya, Masaaki; Kojima, Yoshikazu; and Tanaka, Kojiro, 4,639,755, Cl. 357-28.000.

Kamo, Jun: *See*—
Takemura, Tohru; Nakashima, Atushi; Yoshida, Haruhiko; Kamo, Jun; and Hamada, Eiichi, 4,639,353, Cl. 422-46.000.

Kamp, Klaus: *See*—
Nirschl, Heinrich; Kamp, Klaus; and Stummer, Baldur, 4,639,909, Cl. 370-58.000.

Kamyr, Inc.: *See*—
Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., 4,638,855, Cl. 165-101.000.

Kan, Fumitaka: *See*—
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.

Kanbe, Junichiro: *See*—
Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 4,639,089, Cl. 350-341.000.

Kandzia, Ulrich, to Sigri GmbH. Port for graphitization furnace. 4,639,930, Cl. 373-120.000.

Kane, Timothy J. Truck wheel lug nut protector apparatus. 4,639,045, Cl. 301-37.00S.

Kaneko, Takashi, to NEC Corporation. Data interpolating circuit using a two data word memory. 4,639,920, Cl. 371-31.000.

Kaneko, Yutaka; Kimura, Toshihiko; and Kadokura, Kenji, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material containing a magenta color image-forming coupler. 4,639,415, Cl. 430-558.000.

Kangaroos U.S.A., Inc.: *See*—
Gamm, Robert J., 4,638,579, Cl. 36-136.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Ando, Masatoshi; Mochizuki, Hiromine; and Saito, Kazuta, 4,639,270, Cl. 106-21.000.
Mori, Tohru; Hongo, Takayasu; and Kamikura, Rinzo, 4,639,751, Cl. 346-227.000.

Kao Corporation: *See*—
Kondo, Akihiro; Tsushima, Rikio; and Sumida, Yuzo, 4,639,491, Cl. 524-801.000.

Kaplan, Mitzi. Glove holder for dish drainer. 4,638,915, Cl. 211-13.000.

Kaplan, Murray A.; and Vyas, Dolatrai M., to Bristol-Myers Company. Crystalline form of 7-(dimethylaminomethylene-amino-9a-methoxymitosane. 4,639,528, Cl. 548-422.000.

Karjalainen, Arto J.; and Kurkela, Kauko O. A., to Farmos Group, Ltd. Antihypertensive substituted imidazole derivatives. 4,639,464, Cl. 514-396.000.

Karl Lautenschlager GmbH & Co. KG: *See*—
Lautenschlager, Horst, 4,639,145, Cl. 384-19.000.

Karlsson, Goran R.; and Karnevi, John H. S., to Telefonaktiebolaget LM Ericsson. Monopulse feeder for transmitting and receiving radar signals within two mutually separated frequency bands. 4,639,731, Cl. 342-147.000.

Karnevi, John H. S.: *See*—
Karlsson, Goran R.; and Karnevi, John H. S., 4,639,731, Cl. 342-147.000.

Karpisek, Ladislav S. Wheeled trolley frame. 4,639,002, Cl. 280-5.200.

Kartridg Pak Co., The: *See*—
Woodworth, Gary C.; and Roberts, Gary F., 4,638,729, Cl. 99-450.600.

Kasai, Ichiro: *See*—
Rosbeck, Joseph P.; and Kasai, Ichiro, 4,639,756, Cl. 357-30.000.

Kashiwada, Masao: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Kasperkovitz, Wolfdietrich G.; and Van Rumpt, Herman W., to U.S. Philips Corporation. Frequency-doubling circuit. 4,639,679, Cl. 328-20.000.

Katagiri, Kazuharu: *See*—
Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 4,639,089, Cl. 350-341.000.

Kataishi, Ryuichiro: *See—*
Seki, Hiroshi; and Kataishi, Ryuichiro, 4,639,605, Cl. 250-554.000.
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, to Mitsui Toatsu Kagaku-Kabushiki Kaisha. Pyridazinone derivatives. 4,639,451, Cl. 514-247.000.
Kataoka, Shunzi: *See—*
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.
Katdare, Ashok V., to Merck & Co., Inc. Tablet and formulation. 4,639,458, Cl. 514-311.000.
Kato, Fumihiko: *See—*
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.
Kato, Heizaburo, to Sankyo Manufacturing Co., Ltd. Press machine. 4,638,731, Cl. 100-282.000.
Kato, Heizaburo, to Sankyo Manufacturing Company, Ltd. Roll feed apparatus with adjustable nip. 4,638,990, Cl. 271-272.000.
Kato, Heizaburo, to Sankyo Manufacturing Co., Ltd. Adjustable nip roll feed apparatus with braking/releasing device. 4,638,991, Cl. 271-272.000.
Kato, Kotaro: *See—*
Oshima, Goro; and Kato, Kotaro, 4,639,548, Cl. 178-22.170.
Kato, Masatake, to Canon Kabushiki Kaisha. Telephoto zoom lens. 4,639,095, Cl. 350-427.000.
Kato, Masatoshi: *See—*
Kitaguchi, Hiroshi; and Kato, Masatoshi, 4,639,408, Cl. 430-351.000.
Kato, Takao: *See—*
Misaki, Akira; Sone, Yoshiaki; and Kato, Takao, 4,639,516, Cl. 536-123.000.
Kato, Yasuhiro; and Koyama, Mitsuhiro, to Yamada Iryo Shomei Kabushiki Kaisha. Shadowless lighting equipment for medical use. 4,639,838, Cl. 362-33.000.
Katona, Joseph W., to Mills Products, Inc. Handle construction. 4,638,529, Cl. 16-111.00R.
Katscher, Erich: *See—*
Forner, Siegfried; Katscher, Erich; and Ring, Stefan, 4,639,351, Cl. 376-310.000.
Katzer, Johann: *See—*
Froelich, Hans; Hepperle, Willi; Katzer, Johann; and Stephany, Christian, 4,639,018, Cl. 285-184.000.
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., to Tandem Computers Incorporated. Power interlock system and method for use with multiprocessor systems. 4,639,864, Cl. 364-200.000.
Kaushansky, David A., to Moskovsky Institut Neftekhimicheskoi i Gazovoi Promyshlennosti. Method for treating the bottom-hole formation zone. 4,638,861, Cl. 166-247.000.
Kavka, Frank, to Mallinckrodt, Inc. Preparation of 14-hydroxy-N-ethoxy-carbonyl-norcodeinone. 4,639,520, Cl. 546-45.000.
Kawabata, Takashi: *See—*
Sakai, Shinji; Kawabata, Takashi; and Harada, Yoshihito, 4,639,108, Cl. 354-289.100.
Kawachi, Yasunori: *See—*
Murashige, Yoshio; Yanagase, Akira; Kawachi, Yasunori; and Soga, Junko, 4,639,339, Cl. 260-513.600.
Kawagishi, Mamoru: *See—*
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.
Kawagishi, Toshio; and Nakazyo, Kiyoshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials containing magenta coupler and high boiling point organic solvent. 4,639,413, Cl. 430-546.000.
Kawahara, Atsushi: *See—*
Isogai, Masaki; and Kawahara, Atsushi, 4,639,787, Cl. 358-214.000.
Kawai, Akio; Ito, Ken; and Iwamoto, Hideo, to Nissan Motor Co., Ltd. Device for diagnosis of trouble in vehicle ignition devices. 4,639,676, Cl. 324-380.000.
Kawai Musical Instrument Mfg. Co., Ltd.: *See—*
Deutsch, Ralph, 4,638,707, Cl. 84-1.190.
Kawakami, Shigenobu: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; and Dohi, Hideyuki, 4,639,833, Cl. 361-315.000.
Kawakami, Toshiro: *See—*
Tamura, Toru; Shibata, Noriyoshi; and Kawakami, Toshiro, 4,639,148, Cl. 384-420.000.
Kawakyu, Katsue: *See—*
Ikawa, Yasuo; Kawakyu, Katsue; and Kameyama, Atushi, 4,639,621, Cl. 307-450.000.
Kawamura, Hideaki: *See—*
Sakurada, Nobuaki; Kawamura, Hideaki; and Sasaki, Takashi, 4,639,747, Cl. 346-140.00R.
Kawanami, Takao: *See—*
Yoshiwara, Seishiro; and Kawanami, Takao, 4,638,939, Cl. 228-186.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Togashi, Toshio, 4,638,880, Cl. 180-219.000.
Kawasaki Steel Coporation: *See—*
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.
Kawata, Ken: *See—*
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,639,418, Cl. 430-617.000.
Keane, James W., to Whirlpool Corporation. Hose coupling for vacuum cleaner. 4,639,055, Cl. 339-16.00R.
Keats, Albert B., to United Kingdom Atomic Energy Authority. Monitoring system. 4,639,882, Cl. 364-550.000.
Keesling, Evan L.: *See—*
Stewart, E. Allen, III; and Keesling, Evan L., 4,638,621, Cl. 56-9.000.
Keip, Charles P.: *See—*
Munsey, R. Jack; DeJong, Leroy D.; and Keip, Charles P., 4,639,204, Cl. 425-3.000.
Keller, Henry C. Combination tool to pull up and remove socks, shorts and trousers. 4,638,932, Cl. 223-111.000.
Keller, J. Walter, Jr. Simulated heart display system. 4,639,223, Cl. 434-272.000.
Kelley Company, Inc.: *See—*
Bennett, Mark A., 4,638,612, Cl. 52-173.0DS.
Kellner, Roman; Mayr, Georg; Proksch, Karl-Heinz; and Pockl, Franz, to KUKA Schweissanlagen Roboter GmbH. Mechanism for automatically positioning clamping frames. 4,638,902, Cl. 198-345.000.
Kelly, James E.: *See—*
Daubendiek, Richard L.; Dickerson, Robert E.; and Kelly, James E., 4,639,411, Cl. 430-510.000.
Kelly, Michael N.; Foster, John B.; and Foster, Robert D., to Research Medical, Inc. Venous return catheter. 4,639,252, Cl. 604-282.000.
Kemp, Jack A.: *See—*
Deem, Brian C.; and Kemp, Jack A., 4,638,900, Cl. 192-85.0CA.
Kennedy, Alan D.: *See—*
Hancock, Jack A.; Johnson, Walter D.; and Kennedy, Alan D., 4,639,347, Cl. 264-291.000.
Kennett, Scott W., to E-Systems, Inc. RF pulse transmitter having incidental phase modulation (IPM) correction. 4,639,938, Cl. 375-60.000.
Kennette, John W.: *See—*
Dyer, John; Kennette, John W.; Bassett, Alton H.; and Hall, Stanley D., 4,639,253, Cl. 604-362.000.
Kenney, Edward S.: *See—*
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.
Kentek Information Systems, Inc.: *See—*
Fukae, Kensuke; and Yamashita, Keitaro, 4,639,116, Cl. 355-3.0DD.
Kern, Karl: *See—*
Gressler, Walter; and Kern, Karl, 4,639,185, Cl. 414-733.000.
Kern, Mark T.; and Shamordola, Kenneth A., to Santa Barbara Research Center. Fire sensor cross-correlator circuit and method. 4,639,598, Cl. 250-339.000.
Kersbergen, Mark D., to Intelligent Storage Inc. Cable terminal connector. 4,639,054, Cl. 339-14.00R.
Kershaw, Ian G., to Xerox Corporation. Sheet stack support trays. 4,638,988, Cl. 271-171.000.
Keska, Tadeusz W., to Slimp, Jack B., Jr. Clips for balancing tiltable board game. 4,638,999, Cl. 273-258.000.
Key Pharmaceuticals, Inc.: *See—*
Moore, Luana, 4,639,455, Cl. 514-282.000.
Khan, Tasadduq: *See—*
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., 4,639,280, Cl. 148-404.000.
Khaund, Arup K., to Norton Company. Stress-corrosion resistant proppant for oil and gas wells. 4,639,427, Cl. 501-128.000.
Kidde Consumer Durables, Corporation: *See—*
Compton, Wayne W., 4,639,843, Cl. 362-431.000.
Kiguchi, Masao, to Ricoh Company, Ltd. Call signal detecting device. 4,639,553, Cl. 379-377.000.
Kiguchi, Shoji: *See—*
Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, 4,638,845, Cl. 164-12.000.
Kikuta, Sigeru, to Hirose Electric Co., Ltd. Shield structure for electric connectors. 4,639,067, Cl. 339-143.00R.
Kim, Myung K.; and Viriyayuthakorn, Montri, to AT&T Technologies, Inc. Chemical vapor deposition method and apparatus. 4,638,762, Cl. 118-725.000.
Kimberly-Clark Corporation: *See—*
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., 4,639,254, Cl. 604-385.00R.
Sigl, Wayne C.; and Wolfson, Elizabeth A., 4,638,921, Cl. 221-1.000.
Kimura, Shigeo: *See—*
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, to Nippon Telegraph & Telephone Public Corporation; and Nitto Electric Industrial Co., Ltd. Optical fibers coated with modified 1,4-polybutadienes. 4,639,080, Cl. 350-96.340.
Kimura, Takashi: *See—*
Kobayashi, Junji; and Kimura, Takashi, 4,639,797, Cl. 360-71.000.
Kimura, Toshihiko: *See—*
Kaneko, Yutaka; Kimura, Toshihiko; and Kadokura, Kenji, 4,639,415, Cl. 430-558.000.

Kimura, Yoshio, to Tetra Pak International Aktiebolag. Method of separating and collecting commodities and device for the same. 4,638,903, Cl. 198-419.000.

Kinetic Concepts, Inc.: *See—*
Vrzalik, John H., 4,638,516, Cl. 5-64.000.

King, Michael H.: *See—*
Smith, Donald R., 4,638,821, Cl. 132-7.000.

King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., to Racal Communications Equipment Limited. Direction finding. 4,639,733, Cl. 342-424.000.

Kinsman, Robert G.: *See—*
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.

Kinzel, Peter: *See—*
Staiger, Gerhard; Selmayr, Tassilo; Kinzel, Peter; and Reutter, Anneliese, 4,639,541, Cl. 560-20.000.

Kira, Toru; Miyauchi, Teiichi; and Yoshikawa, Mitsuhiko, to Sharp Kabushiki Kaisha. Thin film magnetic head having a magnetized ferromagnetic film on the MR element. 4,639,806, Cl. 360-113.000.

Kirby, David, to Lutron Electronics Co., Inc. Protective bypass for electronic circuits. 4,639,819, Cl. 361-115.000.

Kirchbrucher, Rudiger: *See—*
Becker, Kunibert; Kirchbrucher, Rudiger; and Preuschoff, Michael, 4,639,169, Cl. 405-291.000.

Kirkland, Thomas R., Jr., to Ingersoll-Rand Company. Fluid control valve. 4,639,196, Cl. 417-228.000.

Kirkland, W. Dean, to KabiVitrum, Inc. Flexible collapsible container with liquid level indicating device. 4,639,251, Cl. 604-260.000.

Kirsch, Reinhard: *See—*
Rosner, Manfred; Loewe, Heinz; Duwel, Dieter; and Kirsch, Reinhard, 4,639,463, Cl. 514-395.000.

Kirschner, Wallace: *See—*
Salazar, Edilberto I.; and Kirschner, Wallace, 4,638,732, Cl. 101-91.000.

Kishi, Hajimu; Matsui, Mitsuo; and Matsuura, Hitoshi, to Fanuc Ltd. Trace control method. 4,639,172, Cl. 409-80.000.

Kishi, Mitsuhiro, to Kabushiki Kaisha Hikoma Seisakusho. Elevating apparatus. 4,638,887, Cl. 187-9.00R.

Kishi, Toshiaki: *See—*
Morioka, Minoru; Kishi, Toshiaki; and Yoshioka, Toshiharu, 4,638,881, Cl. 180-219.000.

Kitada, Tomowo, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for controlling an engine in a hydraulically driven vehicle. 4,638,779, Cl. 123-385.000.

Kitagawa, Katsunosuke: *See—*
Cope, Charles S.; Kitagawa, Katsunosuke; and Konabe, Kazuo, 4,639,337, Cl. 260-408.000.

Kitagawa, Shunji: *See—*
Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.

Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, to Honda Giken Kogyo K.K.; and Kabushiki Kaisha Honda Rokku. Theftproof device. 4,639,713, Cl. 340-63.000.

Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. High range zoom lens. 4,639,096, Cl. 350-427.000.

Kitaguchi, Hiroshi; and Kato, Masatoshi, to Fuji Photo Film Co., Ltd. Process for image formation comprising a heating step. 4,639,408, Cl. 430-351.000.

Kitaguchi, Takahisa, to NEC Corporation. Integratable squarewave pulse oscillator. 4,639,692, Cl. 331-111.000.

Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, to Victor Company of Japan, Ltd. Periodic waveform generation by nonrecyclically reading lower frequency audio samples and recyclically reading higher frequency audio samples. 4,638,710, Cl. 84-1.260.

Kitamura, Mineo: *See—*
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.

Kitanihon Spinning Co., Ltd.: *See—*
Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, 4,638,624, Cl. 57-208.000.

Kitano, Takafumi: *See—*
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.

Kito, Eiichi: *See—*
Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, 4,639,118, Cl. 355-29.000.

Kiuchi, Takeo: *See—*
Otobe, Yutaka; Kiuchi, Takeo; and Tomozawa, Kikuo, 4,639,870, Cl. 364-431.050.

Kiwitz, Heinz: *See—*
Krettenauer, Gustav; and Kiwitz, Heinz, 4,639,008, Cl. 280-405.00R.

KLA Instruments Corporation: *See—*
Chadwick, Curt H.; Shulenberger, Art M.; Taylor, John S.; and Simmons, Richard R., 4,639,587, Cl. 250-201.000.

Kleefisch, Blaise H.: *See—*
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., 4,639,381, Cl. 427-156.000.

Klein, Joachim: *See—*
Kahlert, Wolfgang; Klein, Joachim; Steinert, Hans-Jurgen; and Vorlop, Claus, 4,639,423, Cl. 435-287.000.

Klein, Manfred: *See—*
Schneider, Barbara; Hennig, Kurt; and Klein, Manfred, 4,638,722, Cl. 92-42.000.

Kleinewefers GmbH: *See—*
Pav, Josef; Rauf, Richard; Svenka, Peter; and Wenzel, Reinhard, 4,639,346, Cl. 264-280.000.

Klimmeck, Dietrich A.: *See—*
Teske, Artur; and Klimmeck, Dietrich A., 4,639,097, Cl. 350-507.000.

Klintz, Jerry A.: *See—*
Anderson, Robert L.; Pilarski, James A.; and Klintz, Jerry A., 4,639,653, Cl. 318-599.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Hilbrans, Hermann; Gamroth, Michael; Melcher, Gerhard; and Megerle, Friedrich, 4,639,269, Cl. 75-76.000.

Kloeckner-Humboldt-Deutz AG: *See—*
Beele, Gunther, 4,638,980, Cl. 266-44.000.
Komp, Hermann-Josef, 4,638,878, Cl. 180-89.130.

Kloeckner-Humboldt-Deutz AG Zweigniederlassung Fahr: *See—*
Schaible, Siegfried; and Schneble, Edwin, 4,638,623, Cl. 56-341.000.

Klopsch, Siegfried: *See—*
Jung, Eggert; and Klopsch, Siegfried, 4,639,770, Cl. 358-76.000.

Knapp, Anthony W.; and Werth, Dee A., to Allied Corporation. Anti-decoupling resisting and EMI shielding means for an electrical connector assembly. 4,639,064, Cl. 339-89.00M.

Knasel, Harold E.; and Grigsby, David A., to Process Equipment Company. Safety coupling device for robotic tooling. 4,639,184, Cl. 414-730.000.

Knight, Alan C.; and Malhotra, Satish C., to Du Pont de Nemours, E. I., and Company. Preparation of tetrafluoroethylene fine powder. 4,639,497, Cl. 526-93.000.

Knorr-Bremse AG: *See—*
Wirth, Xaver, 4,638,891, Cl. 188-58.000.
Wirth, Xaver, 4,638,892, Cl. 188-59.000.

Kobayashi, Akihiro; Yamaguchi, Shunzo; Kobayashi, Kiyomi; and Takaba, Hiroaki, to Nippondenso Co., Ltd. Sheathed heater. 4,639,712, Cl. 338-238.000.

Kobayashi, Fuyuki: *See—*
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.

Kobayashi, Hisamine; and Izuhara, Katsuhiro, to Lipton Manufacturing Corporation. Multi-function work finshing machine using barrel containers. 4,638,600, Cl. 51-164.200.

Kobayashi, Junji; and Kimura, Takashi, to Canon Kabushiki Kaisha. Recording or reproducing apparatus. 4,639,797, Cl. 360-71.000.

Kobayashi, Kiyomi: *See—*
Kobayashi, Akihiro; Yamaguchi, Shunzo; Kobayashi, Kiyomi; and Takaba, Hiroaki, 4,639,712, Cl. 338-238.000.

Kobayashi, Toshiji; and Matsumoto, Katsumi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Small size motor. 4,639,628, Cl. 310-194.000.

Kobayashi, Toyohiko: *See—*
Tanaka, Kazumoto; Mashimo, Tohru; Sato, Osamu; and Kobayashi, Toyohiko, 4,639,868, Cl. 364-420.000.

Kobel, Hans: *See—*
Wenger, Roland; Traber, Rene P.; Kobel, Hans; and Hofmann, Hans, 4,639,434, Cl. 514-11.000.

Koch, Alexander W. Disposable casting aid. 4,638,587, Cl. 43-43.120.

Koch, Otto: *See—*
Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.

Kodama, Mitsuo; Miyake, Masaya; Nakano, Minoi; Asai, Tsuyoshi; and Hara, Akio, to Sumitomo Electric Industries, Ltd. Hard alloy containing molybdenum. 4,639,352, Cl. 419-15.000.

Koerner, Siegfried: *See—*
Foerster, Karl-Heinz; and Koerner, Siegfried, 4,639,776, Cl. 358-107.000.

Koets, Howard, to Honeywell Inc. Thermostat with adjustable temperature range setpoint stops. 4,639,709, Cl. 7-360.000.

Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, to Fuji Photo Film Co., Ltd. Photographic paper accommodating apparatus. 4,639,118, Cl. 355-29.000.

Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, to Oiles Industry Co., Ltd. Method of manufacturing wound bush bearing with notch-free flange and mold assembly for manufacturing the same. 4,638,538, Cl. 29-149.50C.

Kohler, Alfred; Schneider, Theodor; and Schubert, Karl F., to SWF Auto-Electric GmbH. Windshield wiper motor. 4,639,065, Cl. 339-119.00R.

Kohmoto, Michio: *See—*
Tajiri, Kazuhiro; Kohmoto, Michio; Saito, Kiyoshi; and Takahira, Hitoshi, 4,639,476, Cl. 523-213.000.

Koichi, Yasushi: *See—*
Murai, Kazuo; and Koichi, Yasushi, 4,639,117, Cl. 355-14.00R.

Koike, Akira, to Daishoku Kako Kabushiki Kaisha. Combined knife and slicer. 4,638,561, Cl. 30-284.000.

Koike, Kazuyoshi; and Tahara, Yasuteru, to Mitsubishi Rayon Co., Ltd. Inspection apparatus for optical fiber assembly. 4,639,130, Cl. 356-73.100.

Koike, Mikio: *See*—
Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,638,751, Cl. 112-254.000.
Koito Seisakusho Co., Ltd.: *See*—
Miyazawa, Kenji, 4,639,839, Cl. 362-64.000.
Kojima, Shigeru: *See*—
Urabe, Tetsuo; and Kojima, Shigeru, 4,639,722, Cl. 340-784.000.
Kojima, Yoshikazu: *See*—
Namiki, Masayuki; Kamiya, Masaaki; Kojima, Yoshikazu; and Tanaka, Kojiro, 4,639,755, Cl. 357-28.000.
Kokubo, Tadayoshi: *See*—
Yoshida, Tetsuo; and Kokubo, Tadayoshi, 4,639,416, Cl. 430-567.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Yamaguchi, Hirohisa; and Yamada, Kazuo, 4,639,778, Cl. 358-135.000.
Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See*—
Sato, Hidekazu, 4,638,882, Cl. 180-287.000.
Kolonia, Robert A. Tool handle. 4,639,029, Cl. 294-57.000.
Komatsu, Masao; and Fujita, Hiroshi, to Osaka University. Process for preparing amorphous phases of intermetallic compounds by a chemical reaction. 4,639,363, Cl. 423-644.000.
Komatsu, Tsunetoshi: *See*—
Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, 4,638,573, Cl. 34-82.000.
Komp, Hermann-Josef, to Kloeckner-Humboldt-Deutz AG. Device for the cushioned mounting of a tractor cab. 4,638,878, Cl. 180-89.130.
Konabe, Kazuo: *See*—
Cope, Charles S.; Kitagawa, Katsunosuke; and Konabe, Kazuo, 4,639,337, Cl. 260-408.000.
Kondo, Akihiro; Tsushima, Rikio; and Sumida, Yuzo, to Kao Corporation. Dispersion stabilizer for water-in-oil suspension polymerization. 4,639,491, Cl. 524-801.000.
Kondo, Tatsunori: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.
Konishiroku Photo Industry Co., Ltd.: *See*—
Honda, Chika; Suzuki, Akio; Machida, Katsutoshi; and Iwata, Masatoshi, 4,639,417, Cl. 430-567.000.
Itoh, Toyotsugu; and Muramatsu, Toshio, 4,639,072, Cl. 350-6.800.
Kaneko, Yutaka; Kimura, Toshihiko; and Kadokura, Kenji, 4,639,415, Cl. 430-558.000.
Mochizuki, Yoshihara; Goto, Sohei; Yagi, Toshihiko; Yamazaki, Katsumasa; and Michiue, Kenji, 4,639,410, Cl. 430-506.000.
Koomey: *See*—
Jones, Marvin R.; and Helfer, Paul E., 4,638,972, Cl. 251-1.300.
Kopecky, Ivyl D., to Haybuster Manufacturing, Inc. Applicator and grain drill shank. 4,638,748, Cl. 111-7.000.
Koper, James G.; and Ljung, Bo H. G., to Singer Company, The. Retainer for electrically fired getter. 4,639,231, Cl. 445-31.000.
Korte, Gerald A. Motorized fishing device and method. 4,638,585, Cl. 43-26.100.
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, to Hitachi, Ltd. Heat storing apparatus. 4,638,646, Cl. 62-478.000.
Kosley, Raymond W., Jr.; and Cherill, Robert J., to Hoechst-Roussel Pharmaceuticals Inc. Labdane compounds, pharmaceutical compositions and use. 4,639,443, Cl. 514-222.000.
Kosley, Raymond W., Jr.; and Cherill, Robert J., to Hoechst-Roussel Pharmaceuticals Inc. Aminoacyllabdanes, pharmaceutical compositions and use. 4,639,446, Cl. 514-222.000.
Kossett, John A., to Reell Precision Manufacturing Corp. Simplified method of securing the clutch spring to the torque input drum of a spring clutch, and resulting mechanism. 4,638,899, Cl. 192-81.00C.
Kosuge, Yutaka: *See*—
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,639,713, Cl. 340-63.000.
Kotecki, Carl A.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.
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Kowa Co., Ltd.: *See*—
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Kowatsch, Ulrich: *See*—
Scheck, Georg; Bogner, Martin; Schmidt, Manfred; and Kowatsch, Ulrich, 4,639,010, Cl. 280-615.000.
Koyama, Mitsuhiro: *See*—
Kato, Yasuhiro; and Koyama, Mitsuhiro, 4,639,838, Cl. 362-33.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Forner, Siegfried; Katscher, Erich; and Ring, Stefan, 4,639,351, Cl. 376-310.000.
Redmann, Eckhard, 4,638,674, Cl. 73-863.120.
Kramer, Charles J.: *See*—
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Harris, Timothy S.; and Harrod, Lawrence R., 4,639,646, Cl. 318-139.000.
Krantz, Leonard A., Jr.: *See*—
Mikolaicyk, John H.; and Krantz, Leonard A., Jr., 4,639,076, Cl. 350-96.200.
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Dierichs, Wolfgang; Gierenz, Gerhard; and Kraus, Gabriella, 4,639,475, Cl. 523-164.000.
Krause, Hans P.: *See*—
Junge, Bodo; Krause, Hans P.; Muller, Lutz; and Puls, Walter, 4,639,436, Cl. 514-24.000.
Krause, Joachim; Romer, Michael; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Thienothiophene derivatives. 4,639,328, Cl. 252-299.610.
Krause, Kenneth W.: *See*—
Day, Chia P.; Krause, Kenneth W.; Whitcomb, Louis L.; and Horn, Berthold K. P., 4,639,878, Cl. 364-513.000.
Kreh, Robert P.; and Spotnitz, Robert M., to W. R. Grace & Co. Oxidation of organic compounds using ceric ions in aqueous methanesulfonic acid. 4,639,298, Cl. 204-59.00R.
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Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, 4,639,163, Cl. 403-322.000.
Krettenauer, Gustav; and Kiwitz, Heinz, to Daimler-Benz Aktiengesellschaft. Self-propelling vehicle with two axle units cantilevered together. 4,639,008, Cl. 280-405.00R.
Kriechbaum, Gerhard: *See*—
Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, 4,638,962, Cl. 244-203.000.
Krishna, Surinder, to Fairchild Semiconductor Corporation. Method of making precision high-value MOS capacitors. 4,639,274, Cl. 148-1.500.
Kroening, Terry R.: *See*—
Randar, Magnus; and Kroening, Terry R., 4,638,904, Cl. 198-468.200.
Krogh, Steven B.; and Lloyd, Adam J. P., to Boeing Company, The. Apparatus and methods for providing rapid protection from accelerative forces experienced by aircraft crew members. 4,638,791, Cl. 128-1.00A.
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Kronberger, Leonard J., to Chrysler Motors Corporation. Spark shield and inlet air vent for an ignition distributor. 4,639,560, Cl. 200-19.00R.
Kronogard, Clas O.: *See*—
Kronogard, Sven O., deceased; Linden, Allen, administrator; Kronogard, Clas O.; and Kronogard, Hakan, 4,638,637, Cl. 60-718.000.
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Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,639,570, Cl. 219-121.0PP.
Krouse, Jere L.: *See*—
Baumgardner, Terry A.; Krouse, Jere L.; and Wild, Alan G., 4,639,200, Cl. 418-48.000.
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Kubick, Frederick, to United Technologies Corporation. Switchable bandwidth filter. 4,639,093, Cl. 350-388.000.
Kubo, Motonobu, to Sanyo-Kokusaku Pulp Company, Limited. Resin compositions curable by active energy rays. 4,639,500, Cl. 526-301.000.
Kubota, Akira: *See*—
Wanibuchi, Hiroshi; and Kubota, Akira, 4,638,704, Cl. 83-628.000.
Kubota, Kazufumi: *See*—
Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, 4,639,118, Cl. 355-29.000.
Kuenzel, Rolf: *See*—
Grenzendoerfer, Dietmar; Wierzgon, Achim; Mueller, Gerhard; Erth, Dieter; Guenther, Ludwig; and Kuenzel, Rolf, 4,638,647, Cl. 66-84.00A.
Kugele, Thomas G.: *See*—
Gilmore, Dennis W.; and Kugele, Thomas G., 4,639,273, Cl. 106-281.00N.
Kugioka, Michihiro, to Canon Kabushiki Kaisha. Lens barrel in which motor capable of selecting stepping drive or brushless drive is provided. 4,639,084, Cl. 350-255.000.
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., to William H. Rorer, Inc. Benzocyclobutene aminoalkylene ethers and thioethers, pharmaceutical compositions and use. 4,639,442, Cl. 514-212.000.
Kujawa, Stephen M.; and Simon, Melvin H. Compact high volume point of use instantaneous water heating system. 4,638,944, Cl. 237-8.00R.

KUKA Schweissanlagen Roboter GmbH: *See*—
Kellner, Roman; Mayr, Georg; Proksch, Karl-Heinz; and Pockl, Franz, 4,638,902, Cl. 198-345.000.

Kulikauskas, Joseph A., to Emhart Industries, Inc. Glassware forming production monitor. 4,639,263, Cl. 65-158.000.

Kumagai, Naotake: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.

Kunkle, Richard P.: *See*—
Jackovitz, John F.; and Kunkle, Richard P., 4,639,401, Cl. 429-30.000.

Kuno, Hiroshi: *See*—
Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, 4,639,151, Cl. 400-63.000.

Kuo, Charles C. Y., to CTS Corporation. Thick film resistive paint and resistors made therefrom. 4,639,391, Cl. 428-210.000.

Kuperus, John H. Method of preparing radionuclide doses. 4,638,809, Cl. 128-653.000.

Kurami, Kunihiko: *See*—
Takahashi, Tohru; and Kurami, Kunihiko, 4,639,652, Cl. 318-568.000.

Kuraray Co., Ltd.: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.

Kurihara, Haruki; Sagara, Minoru; Matumoto, Kenji; and Tamura, Hideo, to Kabushiki Kaisha Toshiba. Semiconductor laser. 4,639,925, Cl. 372-46.000.

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Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Kurkela, Kauko O. A.: *See*—
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,639,464, Cl. 514-396.000.

Kuroda, Akio: *See*—
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; and Kuroda, Akio, 4,639,908, Cl. 369-288.000.

Kuroda, Tokuyuki: *See*—
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.

Kuroda, Yasuo, to Canon Kabushiki Kaisha. Image read-out apparatus with light source driving means. 4,639,608, Cl. 250-578.000.

Kurokawa, Hideki: *See*—
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,638,646, Cl. 62-478.000.

Kurokawa, Kazuo; and Tanaka, Tadashi, to Sanyo Denki Co. Ltd. High gain feedback control system. 4,639,854, Cl. 364-157.000.

Kuroki, Kazuo, to Fuji Electric Co., Ltd. Control circuit for switching transistors. 4,639,823, Cl. 361-159.000.

Kurr, Klaus: *See*—
Idigkeit, Werner; Kurr, Klaus; and Ticks, Gerd-Heinz, 4,638,983, Cl. 267-140.100.

Kusaka, Satoshi, to Sony Corporation. Image input apparatus. 4,639,790, Cl. 358-293.000.

Kuwabara, Yoshiharu; and Hamada, Hiroyoshi, to Mitutoyo Mfg. Co., Ltd. Scanning ray beam generator for optical measuring device. 4,639,141, Cl. 356-387.000.

Kydonieus, Agis F.: *See*—
Von Kohorn, Henry; and Kydonieus, Agis F., 4,639,393, Cl. 428-304.400.

Kyocera Corporation: *See*—
Nagato, Yoshio; and Soroi, Kazunori, 4,639,426, Cl. 501-96.000.

Kyodo News Service: *See*—
Isogai, Masaki; and Kawahara, Atsushi, 4,639,787, Cl. 358-214.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.
Tokuno, Sanji, 4,638,642, Cl. 62-498.000.

L. & C. Steinmuller GmbH: *See*—
Grethe, Klaus, 4,639,209, Cl. 431-4.000.

La Telemecanique Electrique: *See*—
Gaude, Maurice, 4,639,616, Cl. 307-270.000.
Petit, Pierre; and Periot, Jean-Marie, 4,639,668, Cl. 324-208.000.

Laar, Erwin: *See*—
Viehrig, Wolfgang; Wagner, Karl-Heinz; and Laar, Erwin, 4,638,936, Cl. 226-191.000.

LaBelle, Gary E.; and Ask, David T., to Minnesota Mining and Manufacturing Company. Resistively heated photothermographic media on vesicular substrate. 4,639,412, Cl. 430-523.000.

Labelle, Gaston: *See*—
Desrosiers, Wilfrid; and Labelle, Gaston, 4,638,590, Cl. 43-88.000.

LaChance, Raymond H.: *See*—
Shand, J. Richard; and LaChance, Raymond H., 4,639,704, Cl. 335-255.000.

Lacour, Alain, deceased: *See*—
Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased, 4,639,452, Cl. 514-252.000.

Lai, John T.; and Son, Pyong N., to BFGoodrich Company, The. Polyalkylenepolyamine having pendant substituted oxo-piperazinyl-triazines and UV light stabilized compositions. 4,639,479, Cl. 524-100.000.

Lake Center Industries: *See*—
Whetstone, Wayne L.; and Tryan, Fredrick W., 4,638,640, Cl. 62-139.000.

Lalancette, Jean-Marc; and Belanger, Germain, to Hydro-Quebec. Process for the dehalogenation of polyhalogenated hydrocarbon containing fluids. 4,639,309, Cl. 208-262.000.

Lam, William Y., to Ethyl Petroleum Additives, Inc. Lubricating compositions. 4,639,324, Cl. 252-48.600.

Lam, Y. K. Tony: *See*—
Huang, Leeyuan; and Lam, Y. K. Tony, 4,639,466, Cl. 514-456.000.

Lamb, Mark E.: *See*—
Hansen, Loren F.; and Lamb, Mark E., 4,638,867, Cl. 172-22.000.

Lambelin, Georges E.: *See*—
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Lambrecht, Emiel Y.: *See*—
DeBin, Rene F.; and Lambrecht, Emiel Y., 4,638,702, Cl. 83-509.000.

Lancelot, Pierre, to Eurofours. Device for mounting a glass pane on an oven door. 4,638,788, Cl. 126-198.000.

Landsberger, Kurt. Raised superimposed toilet seat and bidet-like device in combination. 4,638,514, Cl. 4-239.000.

Landwehr, Ulrich M. Acquiring measurements of an object by means of photography. 4,639,107, Cl. 354-77.000.

Lang, Jerry M.: *See*—
Lively, Gordon R.; and Lang, Jerry M., 4,638,676, Cl. 74-31.000.

Lange, Gerd, to Fixtures Manufacturing Corporation. Chair back arrangement. 4,639,042, Cl. 297-444.000.

Lankamp, Herman D.: *See*—
Bras, Johan Chr. M.; and Lankamp, Herman D., 4,639,149, Cl. 384-477.000.

Lantzsch, Reinhard; and Reubke, Karl-Julius, to Bayer Aktiengesellschaft. Process for the preparation of β-hydroxyethyl-(1,2,4-triazole) derivatives. 4,639,527, Cl. 548-262.000.

Laporte, Dorothy: *See*—
Rahn, Melanie H.; and Braun, Jane E., 4,639,226, Cl. 434-433.000.

Larrauri, Antonio, administrator: *See*—
Celino, Martin S., deceased; Celino, Cecilio, administrator; and Larrauri, Antonio, administrator, 4,639,467, Cl. 514-468.000.

Larson, Craig A.: *See*—
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,639,207, Cl. 425-503.000.

Larson, Eldon E. Latch integral with latched apparatus. 4,639,249, Cl. 604-198.000.

Laser Applications Limited: *See*—
Hamilton, David C., 4,639,740, Cl. 346-76.00L.

Lasers for Medicine: *See*—
Daly, Richard T.; and Trokel, Stephen L., 4,638,801, Cl. 128-303.100.

Laude, David P., to Harris Corporation. Differential input stage for the realization of low noise and high precision bipolar transistor amplifiers. 4,639,684, Cl. 330-259.000.

Lauer, Manfred: *See*—
Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,639,447, Cl. 514-222.000.

Laurel Bank Machines Co., Ltd.: *See*—
Arikawa, Junichi; Chiba, Hiroshi; Miyazaki, Osamu; and Osanai, Masatoshi, 4,639,582, Cl. 235-379.000.

Laurer, Gerard R., to New York University. Radiation detector. 4,639,600, Cl. 250-363.00S.

Lautenschlager, Horst, to Karl Lautenschlager GmbH & Co. KG. Drawer guide. 4,639,145, Cl. 384-19.000.

Lauterbach-Dammler, Inge: *See*—
Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, 4,639,928, Cl. 373-93.000.

Lawrence, Donald R., to Wagenhals, Fred W. Exercise vehicle. 4,639,007, Cl. 280-234.000.

Lawrence, Robert: *See*—
Leyden, Richard N.; and Lawrence, Robert, 4,639,290, Cl. 156-644.000.

Lazzari, Jean-Pierre, to Commissariat a l'Energie Atomique. Process for producing a magnetic read - write head and head obtained by this process. 4,639,289, Cl. 156-643.000.

LeBlanc, Richard S., to General Motors Corporation. Handwheel assembly for weapon system. 4,638,715, Cl. 89-41.120.

Leborgne, Jose : *See*—
Bouvot, Jean-Francois; and Leborgne, Jose , 4,638,723, Cl. 92-48.000.

Leconte, Michel: *See*—
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,639,429, Cl. 502-117.000.

Lee, Anthony J. J., to National Research Development Corporation. Spark plug. 4,639,635, Cl. 313-123.000.

Lee, Charles M.; and Murphy, Bernard T., to AT&T Bell Laboratories. Trimmable loading elements to control clock skew. 4,639,615, Cl. 307-269.000.

Lee, David A.: *See*—
Taylor, Douglas P.; and Lee, David A., 4,638,895, Cl. 188-280.000.

Lee, Fu-Ming, to Phillips Petroleum Company. Catalytic cracking process. 4,639,308, Cl. 208-100.000.

Lee, James, to Cole, Willis S.; Lee, James; Wortman, Rob; and Frabel, Claude. Chambered headrest mounting for stereophonic loudspeakers. 4,638,884, Cl. 181-141.000.

LeFrancier, Pierre: *See—*
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., to Kimberly-Clark Corporation. Three-dimensional sanitary napkin having absorbent material contoured on the baffle side. 4,639,254, Cl. 604-385.00R.
Leineweber, Gunter; Warnecke, Rolf; and Ruhmer, Heinz, to Volkswagenwerk Aktiengesellschaft. Unbalanced hydraulic amplifier valve assembly. 4,638,719, Cl. 91-373.000.
Leising, John O.: *See—*
Reynes, Enrique G.; and Leising, John O., 4,639,517, Cl. 544-85.000.
Lelu, Andre E.; Grignon, Jean R.; Gonthier, Bruno F.; and Tauzia, Jean-Michel, to Societe Nationale des Poudres et Explosifs. Combustion inhibitor based on an aliphatic polyurethane elastomer for a propellant, and block coated with this inhibitor. 4,638,735, Cl. 102-290.000.
Lemieux, George E.; Lewicki, Reginald T.; and Clauss, Julius A., to Ford Motor Company. Transaxle for a vehicle driveline. 4,638,686, Cl. 74-688.000.
Lemke, Kuno: *See—*
Buchner, Norbert; Lemke, Kuno; and Vogele, Gunter, 4,638,925, Cl. 222-21.000.
Lenasson, Carl-Gusiaf: *See—*
Hassellof, Ake; Lenasson, Carl-Gustaf; and Nordhall, Lennart, 4,638,540, Cl. 29-168.000.
Lenk, Erich: *See—*
Schippers, Heinz; and Lenk, Erich, 4,638,955, Cl. 242-18.0PW.
Leone, David A.: *See—*
Grunert, Kurt A.; Walker, Roger E.; Paton, Charles R.; and Leone, David A., 4,639,564, Cl. 200-144.00R.
Lerat, Bernard, to Commissariat a l'Energie Atomique. Optical surface proximity measuring device and its application to the plotting of the profile of a surface. 4,639,140, Cl. 356-376.000.
Leukel, Bernd: *See—*
Neidig, Arno; Leukel, Bernd; and Bergmann, Lutz, 4,639,759, Cl. 357-74.000.
Level, Michel: *See—*
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
Lever Brothers Company: *See—*
Czempik, Klaus; and Stremmel, Gerd, 4,639,326, Cl. 252-91.000.
Leverance, Robert A.; and Longas, Socrates A., to United States of America, Navy. Near ultrasonic pattern comparison intrusion detector. 4,639,902, Cl. 367-93.000.
Leverberg, Siegfried; and Hofmann, Manfred, to Hydrotechnik GmbH. Measurement coupling for fluidic systems. 4,638,668, Cl. 73-866.500.
Leversee, Garrett J. Key decoding device for automobiles. 4,638,567, Cl. 33-540.000.
Lew, Hyok S. Partially evacuated solar still. 4,639,293, Cl. 202-205.000.
Lewandowski, Edward F.; Cassidy, Dale A.; and Sommer, Robert G., to United States of America, Energy. Method of beam welding metallic parts together and apparatus for doing same. 4,639,571, Cl. 219-121.0EC.
Lewandowski, Thomas: *See—*
Steere, Robert; and Lewandowski, Thomas, 4,638,601, Cl. 51-165.710.
Lewicki, Reginald T.: *See—*
Lemieux, George E.; Lewicki, Reginald T.; and Clauss, Julius A., 4,638,686, Cl. 74-688.000.
Lewis, Gary K., to Litton Systems, Inc. Tunable, dielectric-resonator-stabilized oscillator and method of tuning same. 4,639,690, Cl. 331-96.000.
Lewis, Thomas E.: *See—*
Trinh, Lahn T.; and Lewis, Thomas E., 4,638,780, Cl. 123-416.000.
Leybold-Heraeus GmbH: *See—*
Frings, Heinz; Kabelitz, Hans-Peter; and Ronthaler, Karl-Heinz, 4,639,199, Cl. 418-3.000.
Henzler, Martin, 4,639,602, Cl. 250-396.00R.
Stenzel, Otto, 4,639,567, Cl. 219-10.430.
Leyden, Richard N.; and Lawrence, Robert, to Hughes Aircraft Company. Methods for selectively removing adhesives from polyimide substrates. 4,639,290, Cl. 156-644.000.
Liao, T. K., to Nihon Kohsakuyu Company, Ltd. Water soluble metal-working fluids. 4,639,323, Cl. 252-32.500.
Licentia Patent-Verwaltungs-GmbH: *See—*
Straube, Axel; and Loos, Hans, 4,638,960, Cl. 244-134.00D.
Liebig, Lothar: *See—*
Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.
Lien, Charles: *See—*
Gallios, George C.; and Lien, Charles, 4,639,844, Cl. 363-17.000.
Lienhard, Paul: *See—*
Cseh, Georg; and Lienhard, Paul, 4,639,477, Cl. 524-83.000.
Lietzke, Heinz: *See—*
Baumers, Hans; Lietzke, Heinz; and Schulte, Winfred, 4,638,877, Cl. 180-21.000.
Lim, Hyun S., to Du Pont de Nemours, E. I., and Company. Pump shaft stirrer for grid melter. 4,639,205, Cl. 425-200.000.
Limb, David I.: *See—*
Duckett, Melvyn; and Limb, David I., 4,639,257, Cl. 55-16.000.
Lin, Ying-wei, to Xerox Corporation. Development apparatus with paper debris remover. 4,639,115, Cl. 355-3.0DD.
Linares, Hubert, to Rhone-Poulenc Agrochimie. Deodorized compositions based on organothiophosphorus compounds. 4,639,538, Cl. 558-71.000.
Linde Aktiengesellschaft: *See—*
Norskau, Jurgen; and Richter, Rudolf, 4,639,195, Cl. 417-216.000.
Lindeman, Richard J.; and Rachwalski, Thaddeus M., to TRW Inc. Connector construction for a PC board or the like. 4,639,056, Cl. 339-17.0LC.
Linden, Allen, administrator: *See—*
Kronogard, Sven O., deceased; Linden, Allen, administrator; Kronogard, Clas O.; and Kronogard, Hakan, 4,638,637, Cl. 60-718.000.
Lindgren, Nils E., to SSAB Svenskt Stal AB. Valve arrangement for unloading liquid flow at a non-return valve. 4,638,831, Cl. 137-117.000.
Lindsay, William R. Luminescent fishing lures. 4,638,584, Cl. 43-17.600.
Lindstrom, Fred B., to AB Electrolux. Hand-actuated engine starter. 4,638,775, Cl. 123-185.00G.
Linkowski, William J., to Pitney Bowes Inc. Diagnostic control keyboard for a mailing machine. 4,639,918, Cl. 371-20.000.
Lionnet, Richard, to Raychem Corporation. Heat recoverable connector. 4,639,060, Cl. 339-30.000.
Lipton Manufacturing Corporation: *See—*
Kobayashi, Hisamine; and Izuhara, Katsuhiro, 4,638,600, Cl. 51-164.200.
Litton Systems, Inc.: *See—*
Lewis, Gary K., 4,639,690, Cl. 331-96.000.
Littwin, Kenneth M.; Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, to Electro-Matic Products Co. Degausser/demagnetizer. 4,639,821, Cl. 361-151.000.
Liu, King, to Schwinn Bicycle Company. Chainguard. 4,639,240, Cl. 474-144.000.
Liu, Nan-I, to General Electric Company. Flame retardant elastomeric compositions. 4,639,486, Cl. 524-409.000.
Lively, Gordon R.; and Lang, Jerry M., to Rota-Flex Corporation. Reciprocating drive mechanism with positive pinion-to-rack gear engagement. 4,638,676, Cl. 74-31.000.
Livnat, Aminadav: *See—*
Glatt, Ilana; Livnat, Aminadav; and Kafri, Oded, 4,639,132, Cl. 356-124.500.
Ljung, Bo H. G.: *See—*
Koper, James G.; and Ljung, Bo H. G., 4,639,231, Cl. 445-31.000.
Lloyd, Adam J. P.: *See—*
Krogh, Steven B.; and Lloyd, Adam J. P., 4,638,791, Cl. 128-1.00A.
Lockheed Missiles & Space Company, Inc.: *See—*
Howard, Darryl A.; and Shen, Lawrence Y. L., 4,639,669, Cl. 324-239.000.
Loewe, Heinz: *See—*
Rosner, Manfred; Loewe, Heinz; Duwel, Dieter; and Kirsch, Reinhard, 4,639,463, Cl. 514-395.000.
Lohman, Oskar E., to AB Trama. Brake device for a cycle. 4,638,890, Cl. 188-24.170.
Long, John V.; and Gagliani, John. Forming techniques for shaping polyimide foams. 4,639,343, Cl. 264-45.500.
Longas, Socrates A.: *See—*
Leverance, Robert A.; and Longas, Socrates A., 4,639,902, Cl. 367-93.000.
Loo, Johnson, to International Computers Limited. Pipelined data processing apparatus. 4,639,866, Cl. 364-200.000.
Loomis, Russell M., to Railcar Specialties, Inc. Method of reinforcing a covered hopper car hatch. 4,638,743, Cl. 105-377.000.
Looney, John H., to Xerox Corporation. Document registration system. 4,639,121, Cl. 355-14.00R.
Loos, Hans: *See—*
Straube, Axel; and Loos, Hans, 4,638,960, Cl. 244-134.00D.
L'Oreal: *See—*
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,638,822, Cl. 132-7.000.
Morane, Bruno P., 4,638,927, Cl. 222-83.000.
Losenhausen Maschinenbau AG & Co. Kommanditgesellschaft: *See—*
Baumers, Hans; Lietzke, Heinz; and Schulte, Winfred, 4,638,877, Cl. 180-21.000.
Lovas, Kurt; and Deisinger, Franz, to Schubert & Salzer Maschinenfabrik. Process and apparatus for stopping and restarting an open-end spinning machine with a plurality of spinning devices. 4,638,625, Cl. 57-263.000.
Lowe, Frank J.: *See—*
Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., 4,639,545, Cl. 174-36.000.
Loy, Fernand R., to U.S. Philips Corporation. Collimator for coordinating two optical devices. 4,639,082, Cl. 350-172.000.
LTV Energy Products Company: *See—*
Johnson, Phil E.; and Brock, Robert K., 4,638,726, Cl. 92-241.000.
Lu, Guey T.: *See—*
Murphy, Colin N.; and Lu, Guey T., 4,639,899, Cl. 365-230.000.
Lu, Nicky C.: *See—*
Goodwin, John J.; and Lu, Nicky C., 4,639,622, Cl. 307-482.000.
Lubrano, Maurizio, to Centro Sperimentale Metallurgico S.p.A. Device for control of roll camber in a rolling mill. 4,638,654, Cl. 72-201.000.
Lucky, Lloyd P. Magnetic utensil-holder. 4,638,786, Cl. 126-24.000.
Ludwig, Richard H.; and Mikhail, Joanne E., to Westinghouse Electric Corp. Elevator system. 4,638,889, Cl. 187-29.00R.
Luk Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul, 4,638,684, Cl. 74-574.000.

Lumen Electronics Corporation: *See—*
Wong, John K. Y.; and Wong, Simon K. Y., 4,638,666, Cl. 73-431.000.

Lunardi, Gerhard, to Inventio AG. Step of an escalator or the like equipped with at least one safety device. 4,638,901, Cl. 198-323.000.

Luoma, Robert P., II; and Willis, Frank M., to Du Pont de Nemours, E. I., and Company. Plasmapheresis filtration module having improved sealing means. 4,639,317, Cl. 210-433.200.

Lust, Sigmund: *See—*
Sehring, Richard; Buck, Wolfgang; Prokic-Immel, Ricarda; and Lust, Sigmund, 4,639,438, Cl. 514-129.000.

Lutron Electronics Co., Inc.: *See—*
Kirby, David, 4,639,819, Cl. 361-115.000.

Lybecker, Robert W., to Bomar Corporation, Inc. Modular automatic gate opener. 4,638,597, Cl. 49-340.000.

Lycan, Jennings, to Service Machine Co. Reversing switch. 4,639,558, Cl. 200-1.00V.

Lysaght, Michael J.: *See—*
Schmidt, Baerbel; Samtleben, Walter; and Lysaght, Michael J., 4,639,243, Cl. 604-6.000.

M.A.N.-Roland Druckmaschinen AG.: *See—*
Zingher, Oded, 4,639,881, Cl. 364-521.000.

Maan, Nicolaus, to U.S. Philips Corporation. Device for measuring the static lives of optical fibers. 4,639,131, Cl. 356-73.100.

MacDuffee, Richard J. Collapsible support frame with receptacle. 4,638,967, Cl. 248-97.000.

Machida, Katsutoshi: *See—*
Honda, Chika; Suzuki, Akio; Machida, Katsutoshi; and Iwata, Masatoshi, 4,639,417, Cl. 430-567.000.

Mack, Raymond E.: *See—*
Sitabkhan, Mansur N.; and Mack, Raymond E., 4,638,894, Cl. 188-170.000.

Mackie, David R.: *See—*
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Mackles, Leonard, to Product Resources International, Inc. Aerosol foam. 4,639,367, Cl. 424-45.000.

MacLachlan, Stuart; and O'Neill Bell, Christopher, to Chloride Silent Power Ltd. Sodium sulphur cells and their manufacture. 4,638,555, Cl. 29-623.100.

Macovski, Albert, to General Electric Company. Simultaneous NMR imaging system. 4,639,671, Cl. 324-309.000.

Maeda, Kazuya; and Ishihara, Yasusuke, to Matsushita Electric Industrial Co., Ltd.; and Sano Sharyo Seisakusho Co., Ltd. Hand cart with fulcrum lever and vertically adjustable auxiliary wheels. 4,639,004, Cl. 280-5.320.

Maeda, Yoshinobu; Fujiwara, Kohji; and Naito, Takao, to Matsushita Electric Industrial Co., Ltd. Sheet holding apparatus. 4,638,985, Cl. 269-244.000.

Maejima, Takeshi; and Shiba, Kenji, to Minolta Camera Kabushiki Kaisha. Multiple projector planetarium drive system. 4,639,224, Cl. 434-286.000.

Maekawa, Hideo: *See—*
Moribe, Yoshihiro; Hayashi, Yukitaka; Maekawa, Hideo; and Tsukui, Kunitsugu, 4,639,804, Cl. 360-105.000.

Magee, Robert L., Jr.; and Traweek, Marvin B., IV, to Arlington Automatics Inc. Apparatus for blocking communication between well bore intervals. 4,638,860, Cl. 166-114.000.

Magnetics Research International Corporation: *See—*
McGee, Daniel W., 4,639,626, Cl. 310-155.000.

Magurit-Gefrierschneider GmbH: *See—*
Hager, Juergen; Vieth, Walter; and Manderla, Werner, 4,638,697, Cl. 83-356.300.

Mahanay, Joseph W.; and Savage, Lester D. Gerotor device with dual valving plates. 4,639,202, Cl. 418-59.000.

Mahle GmbH: *See—*
Ripberger, Emil; and Stuska, Gotthard, 4,638,725, Cl. 92-237.000.

Maier, Johann, to Schleicher Maschinenbau und -Vertrieb GmbH. Dowel hole drilling machine. 4,639,171, Cl. 408-89.000.

Maier, Kurt. Gear grinding machine for radial or helical spur gears. 4,638,599, Cl. 51-52.00R.

Maina, Bruno: *See—*
Ghiardo, Fiorenzo; and Maina, Bruno, 4,638,840, Cl. 139-452.000.

Makhlouf, Joseph M.; Falk, Frederick A.; and Piccirilli, Robert M., to PPG Industries, Inc. Phenolic-modified rosin esters. 4,639,492, Cl. 525-54.420.

Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, to Mitsubishi Jukogyo Kabushiki Kaisha; and Kawasaki Steel Coporation. Cooling apparatus for metal strip. 4,638,851, Cl. 165-32.000.

Makino, Tomoatsu: *See—*
Matsui, Takeshi; Takeda, Shunichi; and Makino, Tomoatsu, 4,638,785, Cl. 123-644.000.

Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, to Sony Corporation. Method of manufacturing an amorphous magnetic alloy. 4,639,278, Cl. 148-108.000.

Makishima, Akio; and Tani, Toshiro, to National Institute for Researches in Inorganic Materials; and Agency of Industrial Science and Technology. Functional organic-inorganic composite amorphous material and process for its production. 4,639,329, Cl. 252-501.100.

Makita Electric Works, Ltd.: *See—*
Fushiya, Fusao; Hakamata, Nobuo; Abe, Hiroyuki; and Inoue, Nobuhiro, 4,638,700, Cl. 83-467.00R.

Malard, Marcel: *See—*
Huignard, Jean-Pierre; Malard, Marcel; and de Corlieu, Guy, 4,639,091, Cl. 350-347.00V.

Malaval, Claude, to Novatome. Cover-plug for the core of a fast neutron nuclear reactor. 4,639,350, Cl. 376-290.000.

Malhotra, Satish C.: *See—*
Knight, Alan C.; and Malhotra, Satish C., 4,639,497, Cl. 526-93.000.

Mallinckrodt, Inc.: *See—*
Hoey, George B., 4,639,364, Cl. 424-9.000.
Kavka, Frank, 4,639,520, Cl. 546-45.000.

Malzkorn, Matthias, to Scharmann GmbH & Co. Horizontal drilling and milling machine. 4,638,550, Cl. 29-568.000.

Mamot, Robert M.: *See—*
Ballard, Gary W.; and Mamot, Robert M., 4,638,942, Cl. 236-10.000.

MAN Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Potel, Gerd; and Buchholz, Karl-Heinz, 4,638,742, Cl. 105-199.300.

Mancel, Patrick J. Device for spraying products, more especially, paints. 4,638,949, Cl. 239-307.000.

Manderla, Werner: *See—*
Hager, Juergen; Vieth, Walter; and Manderla, Werner, 4,638,697, Cl. 83-356.300.

Mannesmann AG: *See—*
Sebastian, Wilhelm; Nickel, Wilhelm; and Schirmag, Klaus-Peter, 4,638,655, Cl. 72-208.000.

Marcellus, Leland D. Creosote cutter mounting bracket assembly. 4,638,524, Cl. 15-249.000.

Marcus, Konrad H.; and Chu, Zooey C., to Prince Corporation. Visor with mirror with flexible sliding cover. 4,639,085, Cl. 350-283.000.

Marhoff, Paul: *See—*
Heinze, Udo; and Marhoff, Paul, 4,639,943, Cl. 378-96.000.

Mariani, Elio A.; and Skudera, William J., Jr., to United States of America, Army. Wideband saw channellizer using slanted array input transducer. 4,639,695, Cl. 333-133.000.

Marien, August M.: *See—*
Uytterhoeven, Herman J.; De Winter, Walter F.; and Marien, August M., 4,639,404, Cl. 430-115.000.

Marietta, Walter E., to Sta-Rite Industries, Inc. Apparatus for disabling an obstructed lift mechanism. 4,638,886, Cl. 187-8.490.

Marini, Michele E.: *See—*
Arotin, Robert L.; Walworth, Bryant L.; and Marini, Michele E., 4,639,268, Cl. 71-105.000.

Mario Pinto S.p.A.: *See—*
Berardo, Giuseppe, 4,639,001, Cl. 279-121.000.

Marlek, Edward. Liquid chemical applicator for treatment of a horizontal surface. 4,638,948, Cl. 239-722.000.

Marrone, Joseph: *See—*
McHale, Charles J.; Marrone, Joseph; and Watson, David, 4,639,872, Cl. 364-463.000.

Marschewski, Henry. Ring segment ship hull. 4,638,753, Cl. 114-56.000.

Marschik, David: *See—*
Shestak, Edward J.; and Marschik, David, 4,639,700, Cl. 335-6.000.

Marshall, John; and Oakey, John D., to BOC Group, PLC, The. Refrigeration method and apparatus. 4,638,638, Cl. 62-9.000.

Marshall, John; and Oakey, John D., to BOC Group, plc, The. Gas refrigeration method and apparatus. 4,638,639, Cl. 62-9.000.

Martel, Alain; and Daris, Jean-Paul, to Bristol-Myers Company. Stereocontrolled acetoxyazetidinone process. 4,639,335, Cl. 540-304.000.

Martens, Alan; and Snow, Bennie E., to Westinghouse Electric Corp. Cooldown control system for a combined cycle electrical power generation plant. 4,638,630, Cl. 60-39.182.

Martens, Mark A.: *See—*
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Martin, James M.; Brockett, William S.; Selleck, Ronald R.; and Croteau, Michael G., to Martin Marietta Corporation. Fiber-optic rotation rate sensor having dual interferometer loops. 4,639,138, Cl. 356-350.000.

Martin Marietta Corporation: *See—*
Martin, James M.; Brockett, William S.; Selleck, Ronald R.; and Croteau, Michael G., 4,639,138, Cl. 356-350.000.

Martin, Michael W., to International Computers Limited. Computer system having conversion of operation codes. 4,639,865, Cl. 364-200.000.

Martin, Robert A.: *See—*
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,638,846, Cl. 164-55.100.

Maruyama, Asao; and Miyagawa, Kohzo, to Tsubakimoto Chain Co. Automatic storing equipment. 4,639,187, Cl. 414-787.000.

Maruyama, Hidekazu; and Fujimaki, Kazuo. Auxiliary seat assembly for use in vehicles. 4,639,037, Cl. 297-334.000.

Maruyama, Masahiko: *See—*
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.

Maruzen Sewing Machine Co., Ltd.: *See—*
Mikuni, Yoshio, 4,638,750, Cl. 112-230.000.

Marzabal Martinez, Carlos, to Antonio Puig, S.A. Bottle stopper. 4,638,918, Cl. 215-295.000.

Masaki, Hisaji, to Canon Kabushiki Kaisha. Image overlay apparatus with electronic image storage. 4,639,791, Cl. 358-300.000.

Mashimo, Tohru: *See*—
Tanaka, Kazumoto; Mashimo, Tohru; Sato, Osamu; and Kobayashi, Toyohiko, 4,639,868, Cl. 364-420.000.
Masler, William F., III; and Amjad, Zahid, to B. F. Goodrich Company, The. Process for preparing novel copolymer. 4,639,490, Cl. 524-765.000.
Massa, Sergio: *See*—
Giannetti, Anna; Massa, Sergio; and Re, Cesare, 4,638,580, Cl. 40-503.000.
Massachusetts Institute of Technology: *See*—
Chou, Stephen Y., 4,638,669, Cl. 73-517.00R.
Seyferth, Dietmar; and Yu, Yuan-Fu, 4,639,501, Cl. 528-15.000.
Mastner, Georg, to BBC Brown, Boveri & Company, Limited. Thyristor circuit for current regulation. 4,639,662, Cl. 323-343.000.
Masuda, Eiji; and Fujita, Yasuhiko, to Kabushiki Kaisha Toshiba. Dual-tone multiple-frequency-signal generating apparatus. 4,639,554, Cl. 340-365.00S.
Matecki, Rudolf: *See*—
Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, 4,638,962, Cl. 244-203.000.
Mathews, Marion J., III: *See*—
Hovey, Leonard L.; Mathews, Marion J., III; and Peoples, P. Robert, 4,639,539, Cl. 558-363.000.
Mathis, Thomas C.: *See*—
Birum, Gail H.; Mathis, Thomas C.; and Stolk, Richard D., 4,639,480, Cl. 524-104.000.
Matsui, Fumio; Yanagisawa, Shuichi; Kakuta, Yoshiyuki; and Yoshizawa, Atsushi, to Pioneer Electronic Corporation. Optical recording medium. 4,639,745, Cl. 346-135.100.
Matsui, Mitsuo: *See*—
Kishi, Hajimu; Matsui, Mitsuo; and Matsuura, Hitoshi, 4,639,172, Cl. 409-80.000.
Matsui, Shingo; Ikeda, Hidetsugu; Era, Akio; and Nishimura, Sanji, to Mitsui Aluminium Co., Ltd. Process for recovering gallium from aluminum smelting dust. 4,639,355, Cl. 423-112.000.
Matsui, Takeshi; Takeda, Shunichi; and Makino, Tomoatsu, to Nippondenso Co., Ltd. Ignition system for internal combustion engines. 4,638,785, Cl. 123-644.000.
Matsumoto, Hiromichi; and Hashimoto, Ritsuo, to Omron Tateisi Electronics Company. System for controlling communication between a main control assembly and programmable terminal units. 4,639,889, Cl. 364-900.000.
Matsumoto, Katsumi: *See*—
Kobayashi, Toshiji; and Matsumoto, Katsumi, 4,639,628, Cl. 310-194.000.
Matsumoto, Seikichi; and Ikeda, Hiroyuki, to Fujitsu Limited. Light scanning apparatus. 4,639,071, Cl. 350-3.710.
Matsumoto, Seikichi: *See*—
Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.
Matsunobu, Akira; Horishita, Sumio; and Yamada, Tetsuo, to Ton Company Ltd. Almond nut paste for beverages and desserts. 4,639,374, Cl. 426-43.000.
Matsushima, Hiroaki: *See*—
Sakazume, Akio; Yoshikawa, Hiroki; and Matsushima, Hiroaki, 4,638,643, Cl. 62-209.000.
Matsushima, Tadashi: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.
Matsushita Electric Industrial Co., Ltd.: *See*—
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, 4,639,208, Cl. 431-1.000.
Maeda, Kazuya; and Ishihara, Yasusuke, 4,639,004, Cl. 280-5.320.
Maeda, Yoshinobu; Fujiwara, Kohji; and Naito, Takao, 4,638,985, Cl. 269-244.000.
Mori, Hitoshi, 4,639,777, Cl. 358-120.000.
Murata, Yoshitaka; Hatano, Tsuyoshi; and Ohkubo, Hideo, 4,638,526, Cl. 15-367.000.
Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, 4,639,814, Cl. 360-130.100.
Yamada, Takahiro, 4,639,753, Cl. 357-22.000.
Matsuura, Hirokazu, to Sharp Kabushiki Kaisha. Independent dual electrophotographic copying machine. 4,639,120, Cl. 355-14.00R.
Matsuura, Hitoshi: *See*—
Kishi, Hajimu; Matsui, Mitsuo; and Matsuura, Hitoshi, 4,639,172, Cl. 409-80.000.
Matsu'ura, Yukio: *See*—
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,638,549, Cl. 29-564.400.
Matsuzaki, Harumi: *See*—
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,638,646, Cl. 62-478.000.
Mattel, Inc.: *See*—
Atwood, Robert W., 4,639,234, Cl. 446-327.000.
Matumoto, Kenji: *See*—
Kurihara, Haruki; Sagara, Minoru; Matumoto, Kenji; and Tamura, Hideo, 4,639,925, Cl. 372-46.000.
Maucher, Paul, to Luk Lamellen und Kupplungsbau GmbH. Assembly for taking up and compensating for torque-induced shocks. 4,638,684, Cl. 74-574.000.
Maulandi, Aymon A., to Square D Company. Mechanical time delay mechanism. 4,639,561, Cl. 200-33.00R.
Mavilor Systemes S.A.: *See*—
Casanova, Damien, 4,639,629, Cl. 310-248.000.
Mawhinney, Daniel D., to RCA Corporation. Circuit for separating one type signal component from another. 4,638,808, Cl. 128-653.000.
May, David R.: *See*—
Brooks, Steve M.; and May, David R., 4,639,579, Cl. 219-464.000.
May, James G.: *See*—
Brock, J. Donald; and May, James G., 4,638,747, Cl. 110-264.000.
Mayer, Hartwig, to CEAG Licht- und Stromversorgungstechnik GmbH. Power supply. 4,639,834, Cl. 361-388.000.
Mayr, Georg: *See*—
Kellner, Roman; Mayr, Georg; Proksch, Karl-Heinz; and Pockl, Franz, 4,638,902, Cl. 198-345.000.
Mazaki, Yoshiyuki, to Kabushiki Kaisha Murakoshi Seiko. Shelving device. 4,639,161, Cl. 403-245.000.
Mazda Motor Corporation: *See*—
Tanaka, Kazumoto; Mashimo, Tohru; Sato, Osamu; and Kobayashi, Toyohiko, 4,639,868, Cl. 364-420.000.
McBride, Donald G.: *See*—
Amelio, William J.; Hume, David W.; McBride, Donald G.; and Rickert, Robert G., 4,639,380, Cl. 427-97.000.
McCall, Floyd, to Ametek, Inc. Fluid flowmeter. 4,638,672, Cl. 73-861.520.
McCann, Gilbert D.: *See*—
Shelden, C. Hunter; and McCann, Gilbert D., 4,638,798, Cl. 128-303.00B.
McCanny, John V.; and McWhirter, John G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in her Britannic Majesty's Government of the. Digital data processor incorporating an orthogonally connected logic cell array. 4,639,857, Cl. 364-200.000.
McClellan, William R.: *See*—
Gorman, Michael J.; and McClellan, William R., 4,638,678, Cl. 74-476.000.
McCurry, James J.: *See*—
Bushaw, Kenneth A.; Bustamante, Louis A.; and McCurry, James J., 4,639,126, Cl. 355-3.0SH.
McDonnell Douglas Corporation: *See*—
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., 4,639,281, Cl. 148-407.000.
McEvoy, Dennis L.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.
McFadden, Arthur: *See*—
Shetty, Bola V.; McFadden, Arthur; and Hofer, Peter, 4,639,529, Cl. 548-550.000.
McGaha, Larry E. Composition and method for cleaning painted surfaces. 4,639,327, Cl. 252-143.000.
McGee, Daniel W., to Magnetics Research International Corporation. Permanent magnet variable reluctance generator. 4,639,626, Cl. 310-155.000.
McGonigal, Charles, to AT&T Technologies, Inc. Methods of and apparatus for making slotted beam contact elements. 4,638,559, Cl. 29-874.000.
McHale, Charles J.; Marrone, Joseph; and Watson, David, to Aldis Consultants Inc. Method and apparatus for determining weight and center of gravity of a vehicle. 4,639,872, Cl. 364-463.000.
McIngvale, Pat H., to United States of America, Army. Multi-warhead, anti-armor missile. 4,638,737, Cl. 102-489.000.
McKay, Robert S.; and Dahm, Dennis R., to McKay, Robert S. Toy vehicle and launcher. 4,639,236, Cl. 446-430.000.
McKee, Graham E.: *See*—
Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, 4,639,488, Cl. 524-456.000.
McKee, Kevin D.; and Formwalt, Charles W., Jr., to Deere & Company. Electro-hydraulic control system. 4,638,720, Cl. 91-522.000.
McLean, John R., to Garrett Corporation, The. Engine powered auxiliary air supply system. 4,638,634, Cl. 60-612.000.
McMahan, David R.; and Nicholas, Richard W., to General Motors Corporation. Vehicle headlamp assembly. 4,639,840, Cl. 362-80.000.
McMaster, Ira B.: *See*—
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.
McMillan, Thomas A.; Mitchell, Henry W.; and Cecil, Alvin S. Foot pedal for varying resistance in an electrical circuit. 4,639,710, Cl. 338-108.000.
McMills, Corey J.; and Milroy, James C., to Raychem Corporation. Holder for coupling assembly. 4,639,068, Cl. 339-177.00R.
McNeil, James E., to General Motors Corporation. Plastic covered fastening device and method of assembly. 4,638,544, Cl. 29-434.000.
McNeilly, Alan: *See*—
Howie, Peter W.; and McNeilly, Alan, 4,639,439, Cl. 514-171.000.
McQuinn, Roy L.; and Wade, James J., to Riker Laboratories. Metabolites of triazolo[1,5-c]pyrimidines. 4,639,445, Cl. 514-222.000.
McRae, Daniel D.; and Cain, Joseph B., III, to Harris Corporation. HF avalanche relay communication technique. 4,639,937, Cl. 375-40.000.
McWhirter, John G.: *See*—
McCanny, John V.; and McWhirter, John G., 4,639,857, Cl. 364-200.000.

Meatto, Franklin D.; and Pilpel, Edward D., to Olin Corporation. Snow ski with elastomeric sidewalls. 4,639,009, Cl. 280-602.000.

Mecapec S.A.: *See—*
Fuchs, Ernst; and Fitzi, Karl, 4,639,315, Cl. 210-333.100.

Meccatec S.p.A.: *See—*
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Spock, Wayne R.; and Meisner, Richard P., 4,639,885, Cl. 364-574.000.

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Donaldson, Timothy P.; and Menown, Hugh, 4,639,643, Cl. 315-344.000.

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Johnson, William M.; and Mere, Ilmar, 4,638,868, Cl. 172-762.000.

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Pugnale, Peter J.; and Messmer, Michael J., 4,639,164, Cl. 405-54.000.

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McMills, Corey J.; and Milroy, James C., 4,639,068, Cl. 339-177.00R.

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Donovan, Kyle P., 4,639,039, Cl. 297-353.000.

Milwaukee Electric Tool Corporation: *See—*
Palm, Bernhard, 4,639,170, Cl. 408-76.000.

Minami, Yohichiro: *See—*
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.

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Ikeda, Sakio, 4,638,819, Cl. 131-331.000.

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Johdai, Akiyoshi; Yamada, Hirokazu; Ikenoue, Yoshikazu; and Ishikawa, Takuma, 4,638,992, Cl. 271-293.000.
Maejima, Takeshi; and Shiba, Kenji, 4,639,224, Cl. 434-286.000.
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,639,112, Cl. 354-455.000.

Minox GmbH: *See—*
Rinn, Juergen; and Belitz, Fritz, 4,639,110, Cl. 354-403.000.

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McMillan, Thomas A.; Mitchell, Henry W.; and Cecil, Alvin S., 4,639,710, Cl. 338-108.000.

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Asaeda, Takeaki; Nakamura, Toru; and Yutani, Takashi, 4,639,850, Cl. 363-58.000.
Furuta, Michihiro, 4,639,917, Cl. 371-16.000.
Mizugaki, Shigeo; and Umeki, Tsunenori, 4,639,892, Cl. 365-182.000.
Nakagawa, Tsutomu, 4,639,276, Cl. 148-1.500.
Seino, Kiyoharu; Takagi, Tadashi; and Takeda, Fumio, 4,639,694, Cl. 333-128.000.
Sekikawa, Katsuhide, 4,639,855, Cl. 364-188.000.

Tanino, Junichi, 4,639,912, Cl. 370-86.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.
Mitsubishi Rayon Co., Ltd.: *See—*
Koike, Kazuyoshi; and Tahara, Yasuteru, 4,639,130, Cl. 356-73.100.
Murashige, Yoshio; Yanagase, Akira; Kawachi, Yasunori; and Soga, Junko, 4,639,339, Cl. 260-513.600.
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Mitsui Aluminium Co., Ltd.: *See—*
Matsui, Shingo; Ikeda, Hidetsugu; Era, Akio; and Nishimura, Sanji, 4,639,355, Cl. 423-112.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.
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Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.
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Mitsuyama, Akira: *See—*
Okuda, Masakiyo; Ohnishi, Kazuyuki; and Mitsuyama, Akira, 4,639,125, Cl. 355-23.000.
Mittleman, Herbert, to Baxter Travenol Laboratories, Inc. Luer connection. 4,639,019, Cl. 285-332.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Aoyama, Tsutomu; Nakamura, Taizo; Terao, Naoyosi; and Shinonaga, Hirohiko, 4,639,098, Cl. 350-514.000.
Kuwabara, Yoshiharu; and Hamada, Hiroyoshi, 4,639,141, Cl. 356-387.000.
Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, to Sankyo Company Limited. 2-penem-3-carboxylic acid derivatives and use. 4,639,441, Cl. 514-195.000.
Miyagawa, Kohzo: *See—*
Maruyama, Asao; and Miyagawa, Kohzo, 4,639,187, Cl. 414-787.000.
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Ueno, Michio; Miyagi, Toshimi; and Yamaguchi, Soji, 4,639,663, Cl. 323-356.000.
Miyai, Kenji: *See—*
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,639,448, Cl. 514-226.000.
Miyake, Masaya: *See—*
Kodama, Mitsuo; Miyake, Masaya; Nakano, Minoi; Asai, Tsuyoshi; and Hara, Akio, 4,639,352, Cl. 419-15.000.
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Ueno, Katsuji; Nagaoka, Kenji; Miyashita, Akira; and Ebisu, Satoshi, 4,639,344, Cl. 264-83.000.
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Okita, Masao; and Miyata, Hiroyasu, 4,639,595, Cl. 250-231.0SE.
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Kira, Toru; Miyauchi, Teiichi; and Yoshikawa, Mitsuhiko, 4,639,806, Cl. 360-113.000.
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Arikawa, Junichi; Chiba, Hiroshi; Miyazaki, Osamu; and Osanai, Masatoshi, 4,639,582, Cl. 235-379.000.
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Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
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Axelrod, Joan C.; and Chibnik, Sheldon, 4,639,256, Cl. 44-71.000.
Bulow, Roland E., 4,639,228, Cl. 441-5.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,639,357, Cl. 423-306.000.
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Valyocsik, Ernest W., 4,639,360, Cl. 423-329.000.
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Ide, Fumito; and Mochizuki, Hidenori, 4,639,114, Cl. 355-35.00H.
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Ando, Masatoshi; Mochizuki, Hiromine; and Saito, Kazuta, 4,639,270, Cl. 106-21.000.
Mochizuki, Yoshihara; Goto, Sohei; Yagi, Toshihiko; Yamazaki, Katsumasa; and Michiue, Kenji, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light sensitive-material. 4,639,410, Cl. 430-506.000.
Moeller, Alvin W.: *See—*
Acoraci, Joseph H.; and Moeller, Alvin W., 4,639,722, Cl. 342-371.000.
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Mokveld, Nicolaas J., 4,638,832, Cl. 137-220.000.
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Molloy, R. Michael: *See—*
Hunt, Ann H.; Molloy, R. Michael; Nagarajan, Ramakrishnan; and Schabel, Amelia A., 4,639,433, Cl. 514-8.000.
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Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,639,096, Cl. 350-427.000.
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Waller, Francis E., 4,638,547, Cl. 29-558.000.
Waller, Francis E., 4,639.173, Cl. 409-122.000.
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Hovey, Leonard L.; Mathews, Marion J., III; and Peoples, P. Robert, 4,639,539, Cl. 558-363.000.
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Sacconi, Luigi; Foa , Marco; Bencini, Elena; and Sabarino, Giampiero, 4,639,506, Cl. 528-212.000.
Montgomery, Ronald S. Tapping saddle. 4,638,834, Cl. 137-315.000.
Moon, William G.: *See—*
Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., 4,639,863, Cl. 364-200.000.
Moore Business Forms, Inc.: *See—*
Brunea, Robert W.; and Raby, James M., 4,639,271, Cl. 106-21.000.
Moore, Luana, to Key Pharmaceuticals, Inc. Means of aiding in the prevention of sudden infant death syndrome. 4,639,455, Cl. 514-282.000.
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Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.
Moore, Wildey J. Ambidexterous magazine catch. 4,638,581, Cl. 42-7.000.
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Morane, Bruno P., to L'Oreal. Container for storing and dispensing a liquid product and at least one additional product which are to remain separated during storage. 4,638,927, Cl. 222-83.000.
Morcom, Richard, to Independent Broadcasting Authority. MAC vertical synchronizing signals. 4,639,764, Cl. 358-14.000.
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Raymond, William J.; Morgan, Robert L.; and Miller, Ricky L., 4,639,877, Cl. 364-513.500.
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Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, 4,638,624, Cl. 57-208.000.
Mori, Tohru; Hongo, Takayasu; and Kamikura, Rinzo, to Kanzaki Paper Mfg. Co., Ltd. Image-receiving sheet for heat transfer recording system. 4,639,751, Cl. 346-227.000.
Moribe, Yoshihiro; Hayashi, Yukitaka; Maekawa, Hideo; and Tsukui, Kunitsugu, to Hitachi, Ltd. Head loading system. 4,639,804, Cl. 360-105.000.
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Moritz, Bertil, to ASEA Aktiebolag. Insulation of metallic surfaces in power transformers. 4,639,282, Cl. 156-53.000.
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Morris, John: *See—*
Morse, Milton; and Morris, John, 4,638,652, Cl. 70-454.000.
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Morton Thiokol, Inc.: *See*—
Gilmore, Dennis W.; and Kugele, Thomas G., 4,639,273, Cl. 106-281.00N.
Moser, Bernd, to Boge GmbH. Apparatus for the determination of the distance traveled by a piston in a cylinder. 4,638,670, Cl. 73-658.000.
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Kaushansky, David A., 4,638,861, Cl. 166-247.000.
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Motorola, Inc.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.
Granberg, Helge O.; and Coffman, Samuel L., 4,639,760, Cl. 357-75.000.
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Jouquey, Alain; Salmon, Jean; Mouren, Michel; and Touyer, Gaetan, 4,639,336, Cl. 260-397.500.
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Grenzendoerfer, Dietmar; Wierzgon, Achim; Mueller, Gerhard; Erth, Dieter; Guenther, Ludwig; and Kuenzel, Rolf, 4,638,647, Cl. 66-84.00A.
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Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., 4,639,919, Cl. 371-27.000.
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Clerc, Jean-Frederic; and Muller, Francis, 4,639,090, Cl. 350-346.000.
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Buschmann, Gerhard; and Muller, Georg, 4,638,657, Cl. 73-78.000.
Muller, Hanns P.; Clarenz, Werner; von Gizycki, Ulrich; and Wagner, Kuno, to Bayer Aktiengesellschaft. Substantially colorless organic polyisocyanates, processes for their production and their use in the production of polyurethane plastics. 4,639,502, Cl. 528-45.000.
Muller, Hanns P.: *See*—
Richter, Roland; Muller, Hanns P.; and Wegner, Christian, 4,638,795, Cl. 128-90.000.
Muller, Horst; Zinke, Horst; and Wehner, Wolfgang, to Ciba-Geigy Corporation. Phosphoric acid compounds as co-stabilizers for Me(II)-carboxylates and/or Me(II)-phenolates in PVC. 4,639,482, Cl. 524-137.000.
Muller, Lutz: *See*—
Junge, Bodo; Krause, Hans P.; Muller, Lutz; and Puls, Walter, 4,639,436, Cl. 514-24.000.
Muller, Udo: *See*—
Jacob-Grimschgl, Wolfgang; and Muller, Udo, 4,639,547, Cl. 178-18.000.
Muller, Ulrich: *See*—
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.
Mullins, Randal L.: *See*—
Young, Lawrence R.; Sexton, Gregory J.; Mullins, Randal L.; and Bradley, Brian D., 4,639,738, Cl. 346-75.000.
Multi-Clean, Inc.: *See*—
Todd, Mike J., 4,638,523, Cl. 15-98.000.
Munsey, R. Jack; DeJong, Leroy D.; and Keip, Charles P., to C-Tec, Inc. Apparatus for centrifugally casting concrete panels. 4,639,204, Cl. 425-3.000.
Murai, Kazuo; and Koichi, Yasushi, to Ricoh Company, Ltd. Recording image density control method for electrophotography. 4,639,117, Cl. 355-14.00R.
Murakami, Seiro; and Hamajima, Muneki, to Nippon Kagaku K.K. Method and apparatus for detecting an edge position of a pattern and eliminating overlapping pattern signals. 4,639,604, Cl. 250-548.000.
Muramatsu, Toshio: *See*—
Itoh, Toyotsugu; and Muramatsu, Toshio, 4,639,072, Cl. 350-6.800.
Murashige, Yoshio; Yanagase, Akira; Kawachi, Yasunori; and Soga, Junko, to Mitsubishi Rayon Co., Ltd. Sulfonated polyethyleneimine useful as blood anticoagulant. 4,639,339, Cl. 260-513.600.
Murata, Kiyobumi, to Toko, Inc. Delay line. 4,639,696, Cl. 333-138.000.
Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Wada, Hidekazu, 4,639,699, Cl. 333-202.000.
Ueno, Michio; Miyagi, Toshimi; and Yamaguchi, Soji, 4,639,663, Cl. 323-356.000.
Murata, Yoshifumi: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Siinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Murata, Yoshitaka; Hatano, Tsuyoshi; and Ohkubo, Hideo, to Matsushita Electric Industrial Co., Ltd. Nozzle assembly for vacuum cleaner. 4,638,526, Cl. 15-367.000.
Murphy, Bernard T.: *See*—
Lee, Charles M.; and Murphy, Bernard T., 4,639,615, Cl. 307-269.000.
Murphy, Colin N.; and Lu, Guey T., to Advanced Micro Devices, Inc. Memory circuit having a memory reset and recovery controller. 4,639,899, Cl. 365-230.000.
Murphy, Edmond J., to AT&T Bell Laboratories. Fiber-waveguide self alignment coupler. 4,639,074, Cl. 350-96.150.
Murphy, Michael J.; and Smith, Kent D., to Caterpillar Inc. Bulldozer blade mounting and stabilizing arrangement. 4,638,869, Cl. 172-821.000.
Murray, Peter K.; and Galuska, Stefan, to Merck & Co., Inc. Coccidiosis vaccine. 4,639,372, Cl. 424-88.000.
Murray, Thomas L., Jr.; and Holtey, Thomas O., to Honeywell Information Systems Inc. Apparatus and method for testing and verifying the refresh logic of dynamic MOS memories. 4,639,858, Cl. 364-200.000.
Murray, William R., to Fiber Controls Corp. Blending system weighing unit. 4,638,875, Cl. 177-1.000.
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, to Kyowa Hakko Kogyo Co., Ltd. 1-benzyl-3,5-dimethyl-4-piperdyl ester of a Hantzsch dihydropyridine. 4,639,522, Cl. 546-194.000.
Muzslay, Steven Z., to ITT Corporation. Environmentally sealed connector. 4,639,061, Cl. 339-59.00M.
Myers, Charles M., to Eaton Corporation. Dual station printer mechanism. 4,639,154, Cl. 400-584.000.
Nagaike, Sadanori: *See*—
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.
Nagakura, Masahiko: *See*—
Fujii, Setsuro; Yokoyama, Touru; Ikegaya, Kouji; Yokoo, Nobuo; and Nagakura, Masahiko, 4,639,435, Cl. 514-11.000.
Nagaoka, Kenji: *See*—
Ueno, Katsuji; Nagaoka, Kenji; Miyashita, Akira; and Ebisu, Satoshi, 4,639,344, Cl. 264-83.000.
Nagarajan, Ramakrishnan: *See*—
Hunt, Ann H.; Molloy, R. Michael; Nagarajan, Ramakrishnan; and Schabel, Amelia A., 4,639,433, Cl. 514-8.000.
Nagasawa, Naomi: *See*—
Yamaguchi, Takashi; Nagasawa, Naomi; and Tamura, Hidemasa, 4,639,400, Cl. 428-694.000.
Nagashima, Eiji: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.
Nagashima, Masasumi: *See*—
Uchikata, Yoshio; Nozaki, Mineo; Asakura, Osamu; and Nagashima, Masasumi, 4,639,744, Cl. 346-76.0PH.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronical musical instrument with note frequency data setting circuit and interpolation circuit. 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument with temporal variation data generating circuit and interpolation circuit. 4,638,709, Cl. 84-1.190.
Nagata, Koichi: *See*—
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.
Nagata, Kouichi: *See*—
Tanaka, Kazuto; Kakizawa, Haruo; and Nagata, Kouichi, 4,639,099, Cl. 350-538.000.
Nagatani, Masamichi: *See*—
Miyamoto, Satoshi; and Nagatani, Masamichi, 4,639,295, Cl. 204-38.100.
Nagato, Yoshio; and Soroi, Kazunori, to Kyocera Corporation. Decorative hard golden ceramic article. 4,639,426, Cl. 501-96.000.
Nahara, Akira: *See*—
Arai, Yoshihiro; and Nahara, Akira, 4,639,815, Cl. 360-131.000.
Naito, Takao: *See*—
Maeda, Yoshinobu; Fujiwara, Kohji; and Naito, Takao, 4,638,985, Cl. 269-244.000.
Nakadaira, Shiro: *See*—
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, 4,639,146, Cl. 384-99.000.
Nakagawa, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Method of making thyristor with a high tolerable bias voltage. 4,639,276, Cl. 148-1.500.
Nakahara, Hideki: *See*—
Aizawa, Koichi; Sewa, Shingo; and Nakahara, Hideki, 4,639,489, Cl. 524-588.000.

Nakahata, Kimio: *See*—
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Camera system capable of interchanging its objective lens. 4,639,112, Cl. 354-455.000.
Nakai, Toshihiko, to Citizen Watch Co., Ltd. Control system for a cooling fan in an impact printer. 4,639,650, Cl. 318-333.000.
Nakamichi Corporation: *See*—
Nakamichi, Niro, 4,639,812, Cl. 360-126.000.
Nakamichi, Niro, to Nakamichi Corporation. Magnetic head and apparatus for automatically adjusting the azimuth position thereof. 4,639,812, Cl. 360-126.000.
Nakamizo, Nobuhiro: *See*—
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.
Nakamoto, Mitsuyoshi: *See*—
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, 4,639,208, Cl. 431-1.000.
Nakamura, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Method for making a diaphragm for an electro-acoustic transducer. 4,639,283, Cl. 156-89.000.
Nakamura, Ichiro, to Hitachi, Ltd. Fluid-pressure driving device. 4,638,718, Cl. 91-178.000.
Nakamura, Mutsuaki: *See*—
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; and Kuroda, Akio, 4,639,908, Cl. 369-288.000.
Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, to Hitachi, Ltd. Lint and raveling collector for clothes dryer. 4,638,573, Cl. 34-82.000.
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Developing apparatus. 4,638,760, Cl. 118-658.000.
Nakamura, Taizo: *See*—
Aoyama, Tsutomu; Nakamura, Taizo; Terao, Naoyosi; and Shinonaga, Hirohiko, 4,639,098, Cl. 350-514.000.
Nakamura, Toru: *See*—
Asaeda, Takeaki; Nakamura, Toru; and Yutani, Takashi, 4,639,850, Cl. 363-58.000.
Nakamura, Yuji: *See*—
Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, 4,639,814, Cl. 360-130.100.
Nakamura, Yutaka: *See*—
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.
Ota, Toyokazu; and Nakamura, Yutaka, 4,639,292, Cl. 162-375.000.
Nakane, Masami, to E. R. Squibb & Sons, Inc. 7-oxabicycloheptane substituted keto-amide prostaglandin analogs useful in the treatment of thrombotic disease. 4,639,461, Cl. 514-382.000.
Nakano, Minol: *See*—
Kodama, Mitsuo; Miyake, Masaya; Nakano, Minol; Asai, Tsuyoshi; and Hara, Akio, 4,639,352, Cl. 419-15.000.
Nakano, Takuo: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.
Nakashima, Atushi: *See*—
Takemura, Tohru; Nakashima, Atushi; Yoshida, Haruhiko; Kamo, Jun; and Hamada, Eiichi, 4,639,353, Cl. 422-46.000.
Nakata, Hozumi; and Yamakawa, Tsutomu, to Nihon Dempa Kogyo Co., Ltd. Piezoelectric resonator mountings. 4,639,632, Cl. 310-351.000.
Nakayama, Keiji: *See*—
Taniguchi, Koki; Yamaguchi, Shigeri; and Nakayama, Keiji, 4,639,062, Cl. 339-59.00M.
Nakazato, Kunihiro: *See*—
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.
Nakazyo, Kiyoshi: *See*—
Kawagishi, Toshio; and Nakazyo, Kiyoshi, 4,639,413, Cl. 430-546.000.
Nalco Chemical Company: *See*—
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., 4,639,381, Cl. 427-156.000.
Nam, Chul W. Internal combustion engine system. 4,638,635, Cl. 60-716.000.
Namba, Hideaki: *See*—
Kamei, Eiichi; and Namba, Hideaki, 4,638,778, Cl. 123-339.000.
Sakai, Tuguyasu; Namba, Hideaki; and Ohba, Masahiro, 4,639,871, Cl. 364-431.100.
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; and Kuroda, Akio, to Victor Company of Japan, Ltd. High density information records made of conductive resin compositions comprising inorganic power stabilizers. 4,639,908, Cl. 369-288.000.
Namiki, Masayuki; Kamiya, Masaaki; Kojima, Yoshikazu; and Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Thermosensitive semiconductor device using Darlington circuit. 4,639,755, Cl. 357-28.000.
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, to Nippon Avionics Co., Ltd. Apparatus for determining the three-dimensional position and attitude. 4,639,220, Cl. 433-69.000.
Narumo, Kinzo: *See*—
Shimamiya, Yukio; Narumo, Kinzo; and Ebihara, Hiroshi, 4,639,066, Cl. 339-132.00B.
National Institute for Researches in Inorganic Materials: *See*—
Makishima, Akio; and Tani, Toshiro, 4,639,329, Cl. 252-501.100.
National Research Development Corporation: *See*—
De Brie Perry, Forbes G., 4,638,687, Cl. 74-691.000.
Jones, Gerald M., 4,639,158, Cl. 403-31.000.
Lee, Anthony J. J., 4,639,635, Cl. 313-123.000.
NCR Corporation: *See*—
Granzow, Robert H.; and Gupta, Desh B., 4,638,993, Cl. 271-315.000.
NEC Corporation: *See*—
Hirosaki, Botaro; and Tanaka, Osamu, 4,639,939, Cl. 375-118.000.
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.
Kaneko, Takashi, 4,639,920, Cl. 371-31.000.
Kitaguchi, Takahisa, 4,639,692, Cl. 331-111.000.
Oshima, Goro; and Kato, Kotaro, 4,639,548, Cl. 178-22.170.
Suzuki, Norio, 4,639,767, Cl. 358-21.00R.
Needham, James R.: *See*—
Smith, Glenn C.; Needham, James R.; and Turnbull, William T., 4,639,176, Cl. 411-468.000.
Neefe, Charles W. Spin cast ocular cometic device with color separation. 4,639,105, Cl. 351-162.000.
Nehezipari Muszaki Egyetem: *See*—
Bader, Imre; Berecz, Endre; Szina, Gabor; and Horvath, Janos, 4,639,304, Cl. 204-413.000.
Neidhart, Peter: *See*—
Dahler, Peter; Neidhart, Peter; Sadek, Kadry; and Stemmler, Herbert, 4,639,846, Cl. 363-39.000.
Neidig, Arno; Leukel, Bernd; and Bergmann, Lutz, to Brown, Boveri & Cie., AG. Power transistor module. 4,639,759, Cl. 357-74.000.
Neilson, John M. S.; and Brackelmanns, Norbert W., to RCA Corporation. MOSFET with reduced bipolar effects. 4,639,762, Cl. 357-23.800.
Neilson, John M. S.: *See*—
Wheatley, Carl F., Jr.; Neilson, John M. S.; and Russell, John P., 4,639,754, Cl. 357-23.400.
Nels, Terry E.; Eldridge, Larry; and Doty, Gerald L., to General Motors Corporation. Clutch plate member having layer of high durability, self-conforming friction facing. 4,639,392, Cl. 428-283.000.
Nelson, Alec L., to Sperry Corporation. Digital phase and frequency detector. 4,639,680, Cl. 328-134.000.
Nemecek, Amy L.: *See*—
Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., 4,638,865, Cl. 166-274.000.
Neste Oy: *See*—
Bergstrom, Christer, 4,639,398, Cl. 428-451.000.
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,514, Cl. 536-30.000.
Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,515, Cl. 536-30.000.
Neubauer, Jerry L.; Schmidt, Laurence J.; and Voss, Steven H., to International Business Machines Corporation. Shrink ring for disk clamping. 4,639,802, Cl. 360-98.000.
Neuhaus, Josef, to Westermann Kommanditgesellschaft. Trash pail for installation in a cabinet having a swingable door. 4,639,050, Cl. 312-273.000.
Neumann, David B.; and Hunt, Robert D. Fish securing device. 4,638,591, Cl. 43-89.000.
New Castle Industries, Inc.: *See*—
Frankland, James D., Jr., 4,639,143, Cl. 366-89.000.
New England Medical Center Hospitals, Inc.: *See*—
Babior, Bernard M., 4,639,373, Cl. 424-101.000.
New Holland, Inc.: *See*—
Strosser, Richard P.; Bohman, Carl E.; and Chow, Mark K., 4,639,666, Cl. 324-202.000.
New York Blood Center, Inc.: *See*—
Prince, Alfred M.; and Vnek, John, 4,639,371, Cl. 424-86.000.
New York Institute of Technology: *See*—
Glenn, William E., 4,639,788, Cl. 358-233.000.
New York University: *See*—
Laurer, Gerard R., 4,639,600, Cl. 250-363.00S.
Newco Enterprises, Inc.: *See*—
Webster, Joseph P., 4,638,928, Cl. 222-155.000.
Newell, Alfred T., III; and Nichols, E. Lane, to A. T. Newell Co. Inc. Electronic thermostat. 4,638,850, Cl. 165-26.000.
Newman, Michael G.; and Carranza, Fermin A., Jr. Fluoride-coated dental floss. 4,638,823, Cl. 132-91.000.
Newsom, Horace R. Self mixing sprayer. 4,638,924, Cl. 222-1.000.
NGK Insulators, Ltd.: *See*—
Ogawa, Yutaka; Ogasawara, Takayuki; and Hori, Yoshiaki, 4,638,683, Cl. 74-567.000.
Shibata, Kazuyoshi; and Nishizawa, Hitoshi, 4,639,305, Cl. 204-426.000.
NGK Spark Plug Co., Ltd.: *See*—
Nishiki, Masahiro, 4,639,698, Cl. 333-187.000.
Niazi, Sarfaraz; and Shemesh, Alvin, to Farmacon Research Corporation. Chewing gum containing a medicament and taste maskers. 4,639,368, Cl. 424-48.000.
Nicholas, Richard W.: *See*—
McMahan, David R.; and Nicholas, Richard W., 4,639,840, Cl. 362-80.000.

Nichols, E. Lane: *See—*
Newell, Alfred T., III; and Nichols, E. Lane, 4,638,850, Cl. 165-26.000.

Nichols, James O. Sun shade apparatus for a lounge chair. 4,639,036, Cl. 297-184.000.

Nichols, Walter A.; and Wayne, Reginald, to Philip Morris Incorporated. Method of making a filter cigarette. 4,638,818, Cl. 131-281.000.

Nickel, Wilhelm: *See—*
Sebastian, Wilhelm; Nickel, Wilhelm; and Schirmag, Klaus-Peter, 4,638,655, Cl. 72-208.000.

Niebes, Paul J.: *See—*
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Nield, Kenneth J.: *See—*
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.

Nifco Inc.: *See—*
Omata, Nobuaki, 4,638,528, Cl. 16-82.000.

Nihon Dempa Kogyo Co., Ltd.: *See—*
Nakata, Hozumi; and Yamakawa, Tsutomu, 4,639,632, Cl. 310-351.000.

Nihon Jukagaku Kogyo Kabushiki Kaisha: *See—*
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Nihon Kohsakuyu Company, Ltd.: *See—*
Liao, T. K., 4,639,323, Cl. 252-32.500.

Nilarp, Anders, to International Rectifier Corporation. Method of manufacture of semiconductor device. 4,638,553, Cl. 29-580.000.

Nilsen, Carl-Otto: *See—*
Gruzman, Boris; and Nilsen, Carl-Otto, 4,639,572, Cl. 219-121.0LG.

Nimura, Hitoshi: *See—*
Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, 4,639,743, Cl. 346-76.0PH.

Nippon Acchakutanshi Seizo Kabushiki Kaisha: *See—*
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,638,549, Cl. 29-564.400.

Nippon Air Brake Co., Ltd.: *See—*
Imanaka, Asaji, 4,639,047, Cl. 303-15.000.

Nippon Avionics Co., Ltd.: *See—*
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Nakamura, Akira, 4,639,283, Cl. 156-89.000.

Nippon Kagaku K.K.: *See—*
Murakami, Seiro; and Hamajima, Muneki, 4,639,604, Cl. 250-548.000.

Nippon Kogaku K. K.: *See—*
Aono, Yasuhiro, 4,639,094, Cl. 350-413.000.
Isogai, Masaki; and Kawahara, Atsushi, 4,639,787, Cl. 358-214.000.
Ohkubo, Yuji, 4,639,113, Cl. 354-472.000.

Nippon Kokan, K.K.: *See—*
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Sugitani, Yuji; and Tamaoki, Naohiro, 4,639,573, Cl. 219-124.220.

Nippon Oil Co., Ltd.: *See—*
Hara, Hajime; Orii, Shingo; Aoyama, Kazuho; and Enomoto, Masami, 4,639,503, Cl. 528-92.000.

Nippon Petrochemicals Company, Ltd.: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; and Dohi, Hideyuki, 4,639,833, Cl. 361-315.000.

Nippon Seiko Kabushiki Kaisha: *See—*
Tanaka, Hirohisa, 4,638,691, Cl. 74-866.000.

Nippon Steel Corporation: *See—*
Yoshiwara, Seishiro; and Kawanami, Takao, 4,638,939, Cl. 228-186.000.

Nippon Telegraph & Telephone Public Corporation: *See—*
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.

Nippondenso Co., Ltd.: *See—*
Kamei, Eiichi; and Namba, Hideaki, 4,638,778, Cl. 123-339.000.
Kobayashi, Akihiro; Yamaguchi, Shunzo; Kobayashi, Kiyomi; and Takaba, Hiroaki, 4,639,712, Cl. 338-238.000.
Matsui, Takeshi; Takeda, Shunichi; and Makino, Tomoatsu, 4,638,785, Cl. 123-644.000.
Sakai, Tuguyasu; Namba, Hideaki; and Ohba, Masahiro, 4,639,871, Cl. 364-431.100.
Yamanaka, Yasutoshi; Ageishi, Kazunobu; and Izumida, Teruo, 4,638,856, Cl. 165-119.000.

Nirschl, Heinrich; Kamp, Klaus; and Stummer, Baldur, to Siemens Aktiengesellschaft. Digital signal distributor. 4,639,909, Cl. 370-58.000.

Nishigaki, Masahide: *See—*
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Nishihara, Toshio: *See—*
Yatabe, Toshiaki; Nishihara, Toshio; and Suzuki, Nobuo, 4,639,069, Cl. 350-1.700.

Nishikawa, Toshio; Ishikawa, Youhei; and Wada, Hidekazu, to Murata Manufacturing Co., Ltd. Dielectric resonator comprising a resonant dielectric pillar mounted in a conductively coated dielectric case. 4,639,699, Cl. 333-202.000.

Nishiki, Masahiro, to NGK Spark Plug Co., Ltd. Ceramic electronic filter. 4,639,698, Cl. 333-187.000.

Nishimatsu, Masaharu; Ide, Toshiaki; and Arioka, Hiroyuki, to TDK Corporation. Magnetic recording medium. 4,639,389, Cl. 428-141.000.

Nishimura, Sadanori, to Honda Giken Kogyo Kabushiki Kaisha. Damper device for a torque converter clutch. 4,638,897, Cl. 192-3.300.

Nishimura, Sanji: *See—*
Matsui, Shingo; Ikeda, Hidetsugu; Era, Akio; and Nishimura, Sanji, 4,639,355, Cl. 423-112.000.

Nishina, Takashi: *See—*
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.

Nishino, Takaichi: *See—*
Fujita, Yasuyuki; and Nishino, Takaichi, 4,639,040, Cl. 297-379.000.

Nishizawa, Hitoshi: *See—*
Shibata, Kazuyoshi; and Nishizawa, Hitoshi, 4,639,305, Cl. 204-426.000.

Nissan Chemical Industries Ltd.: *See—*
Fujikawa, Yoshihiro; Sakashita, Mitsuaki; and Tsuruzoe, Nobutomo, 4,639,444, Cl. 514-222.000.

Nisan Diesel Co., Ltd.: *See—*
Moriizumi, Ryoji; Suzuki, Yoichi; and Ameda, Kazuhiro, 4,638,883, Cl. 180-324.000.

Nissan Motor Co., Ltd.: *See—*
Aikawa, Hiroshi, 4,639,006, Cl. 280-96.100.
Hiraiwa, Kazuyoshi, 4,638,688, Cl. 74-763.000.
Kawai, Akio; Ito, Ken; and Iwamoto, Hideo, 4,639,676, Cl. 324-380.000.
Takahashi, Tohru; and Kurami, Kunihiko, 4,639,652, Cl. 318-568.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.
Tajiri, Kazuhiro; Kohmoto, Michio; Saito, Kiyoshi; and Takahira, Hitoshi, 4,639,476, Cl. 523-213.000.

Nitzsche, Erhard: *See—*
Grossmann, Stefan; and Nitzsche, Erhard, 4,638,734, Cl. 101-248.000.

Nixdorf Computer AG: *See—*
Baitz, Guenter; and Dobring, Wilfried, 4,638,908, Cl. 206-0.800.

Nixon, Brian J.: *See—*
Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-73.000.

Noda, Yoichiro: *See—*
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,639,713, Cl. 340-63.000.

Nohara, Fujio; and Fujinawa, Tomoaki, to Ikeda Mohando Co., Ltd. Aminoalkylphenoxy derivatives. 4,639,523, Cl. 546-209.000.

Nomura, Hirokazu: *See—*
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.

Nonaka, Shingo: *See—*
Toda, Masumi; Ozaki, Yukio; and Nonaka, Shingo, 4,638,945, Cl. 239-143.000.

Nordhall, Lennart: *See—*
Hassellof, Ake; Lenasson, Carl-Gustaf; and Nordhall, Lennart, 4,638,540, Cl. 29-168.000.

Nordson Corporation: *See—*
Gabriel, Alexander, 4,638,951, Cl. 239-707.000.
Sticher, Charles K., 4,639,611, Cl. 307-117.000.

Noren, Don W. Heat pipe assembly. 4,638,854, Cl. 165-76.000.

Norman, Peter: *See—*
Abram, Trevor S.; Norman, Peter; and Warren, Brian T., 4,639,535, Cl. 549-419.000.

Normann, Norbert, to Doduco KG Dr. Eugen Durrwachter. Magnetic field sensor comprising Wiegand wires or similar bistable magnetic elements. 4,639,670, Cl. 324-260.000.

Norskau, Jurgen; and Richter, Rudolf, to Linde Aktiengesellschaft. Power control devices for hydrostatic pumps. 4,639,195, Cl. 417-216.000.

North American Philips Corporation: *See—*
Hirayama, Chikara; and Andrew, Kenneth F., 4,639,639, Cl. 313-639.000.
Singer, Barry M.; and Jayaraman, Rajsekhar, 4,639,761, Cl. 357-234.000.
Strange, Thomas F.; and Carino, John W., 4,639,827, Cl. 361-272.000.
Strange, Thomas F.; and Carino, John W., 4,639,828, Cl. 361-272.000.

Norton Company: *See—*
Khaund, Arup K., 4,639,427, Cl. 501-128.000.

Novack, Robert L.: *See—*
Tomasovic, Beth A.; and Novack, Robert L., 4,639,306, Cl. 204-432.000.

Novak, Mark F.: *See*—
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.
Novatome: *See*—
Malaval, Claude, 4,639,350, Cl. 376-290.000.
Noworolski, Zbigniew; and Ferens, Jerzy, to International Exide Electronics/Corporation. Snubber circuit for H.F. bridge converter. 4,639,849, Cl. 363-56.000.
Nozaki, Mineo: *See*—
Uchikata, Yoshio; Nozaki, Mineo; Asakura, Osamu; and Nagashima, Masasumi, 4,639,744, Cl. 346-76.0PH.
Nussbaecher, Hans K., to Siemens Aktiengesellschaft. Circuit arrangement for accelerated carry formation in an adder device. 4,639,888, Cl. 364-788.000.
Nye, Leroy M., Jr.; and Pike, Thomas W., to Xerox Corporation. Cleaning system for a multicolor electrophotographic printing machine. 4,639,124, Cl. 355-15.000.
Oakey, John D.: *See*—
Marshall, John; and Oakey, John D., 4,638,638, Cl. 62-9.000.
Marshall, John; and Oakey, John D., 4,638,639, Cl. 62-9.000.
Oakley, Barbara: *See*—
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., 4,639,254, Cl. 604-385.00R.
Oberlander, Karol H.; and Umlauf, Norbert, to Umlauf, Norbert. Shears, especially circular knife shears. 4,638,701, Cl. 83-490.000.
Obermeier, Rainer; Geiger, Rolf; and Grau, Ulrich, to Hoechst Aktiengesellschaft. Process for converting preproinsulin analogs into insulins. 4,639,333, Cl. 530-303.000.
O'Brien, Thomas P., to Kabushiki Kaisha Toshiba. Gimballed three-dimensional display system. 4,639,081, Cl. 350-144.000.
Ochiai, Yoshitaka: *See*—
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.
Ochii, Kiyofumi: *See*—
Iwahashi, Hiroshi; and Ochii, Kiyofumi, 4,639,895, Cl. 365-200.000.
Odeco, Inc.: *See*—
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.
Office National d'Etudes et de Recherche Aerospatiales (ONERA): *See*—
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Marc C. F., 4,639,280, Cl. 148-404.000.
Ogasawara, Takayuki: *See*—
Ogawa, Yutaka; Ogasawara, Takayuki; and Hori, Yoshiaki, 4,638,683, Cl. 74-567.000.
Ogawa, Yutaka; Ogasawara, Takayuki; and Hori, Yoshiaki, to NGK Insulators, Ltd. Camshaft for engine. 4,638,683, Cl. 74-567.000.
Ogden Industries Pty Ltd: *See*—
Dunphy, Gerald F.; and Best, Lance E., 4,639,022, Cl. 292-150.000.
Ogushi, Yoshimi: *See*—
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.
Ohashi, Toshio: *See*—
Ito, Masashi; Ohashi, Toshio; and Ui, Katsumi, 4,639,272, Cl. 106-243.000.
Ohba, Masahiro: *See*—
Sakai, Tuguyasu; Namba, Hideaki; and Ohba, Masahiro, 4,639,871, Cl. 364-431.100.
Ohkubo, Hideo: *See*—
Murata, Yoshitaka; Hatano, Tsuyoshi; and Ohkubo, Hideo, 4,638,526, Cl. 15-367.000.
Ohkubo, Yuji, to Nippon Kogaku K. K. Camera display device. 4,639,113, Cl. 354-472.000.
Ohkura Electric Co., Ltd.: *See*—
Motomiya, Takehiko, 4,639,852, Cl. 364-138.000.
Ohnishi, Kazuyuki: *See*—
Okuda, Masakiyo; Ohnishi, Kazuyuki; and Mitsuyama, Akira, 4,639,125, Cl. 355-23.000.
Ohnishi, Masanori: *See*—
Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, 4,639,814, Cl. 360-130.100.
Ohta, Ikumi: *See*—
Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, 4,638,618, Cl. 52-509.000.
Ohta, Jiro, to Hitachi, Ltd. Tubular water wheel. 4,639,190, Cl. 415-129.000.
Ohta, Nobuhiro: *See*—
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.
Ohtsuki, Osamu, to Fujitsu Limited. Charge coupled device with meander channel and elongated, straight, parallel gate electrodes. 4,639,940, Cl. 377-60.000.
Ohura, Masaki: *See*—
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.
Ohwada, Yoshiaki: *See*—
Shimbo, Masaru; Fukuda, Kiyoshi; and Ohwada, Yoshiaki, 4,638,552, Cl. 29-576.00J.
Oiles Industry Co., Ltd.: *See*—
Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, 4,638,538, Cl. 29-149.50C.
Oji Seisha Kabushiki Kaisha: *See*—
Ota, Toyokazu; and Nakamura, Yutaka, 4,639,292, Cl. 162-375.000.
Oji Seishi Kabushiki Kaisha: *See*—
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.
Okada, Chiharu: *See*—
Aono, Koji; Saito, Toshinori; and Okada, Chiharu, 4,639,361, Cl. 423-347.000.
Okada, Hiroshi: *See*—
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.
Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Liquid crystal device. 4,639,089, Cl. 350-341.000.
Okada, Tsutomu, to Olympus Optical Co., Ltd. High frequency instrument for incision and excision. 4,638,802, Cl. 128-303.140.
Okamoto, Kenji: *See*—
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, 4,639,208, Cl. 431-1.000.
Okamoto, Yasushi: *See*—
Imai, Akio; Okamoto, Yasushi; and Saito, Masatoshi, 4,639,494, Cl. 525-271.000.
Okamura, Takayuki: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Okanobu, Taiwa, to Sony Corporation. DC-DC converter. 4,639,659, Cl. 323-224.000.
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, to Nippon Acchakutanshi Seizo Kabushiki Kaisha. Apparatus for manufacturing electrical harnesses. 4,638,549, Cl. 29-564.400.
Oki Denki Giken Kogyo Kabushiki Kaisha: *See*—
Otobe, Yutaka; Kiuchi, Takeo; and Tomozawa, Kikuo, 4,639,870, Cl. 364-431.050.
Okita, Masao; and Miyata, Hiroyasu, to Alps Electric Co., Ltd. Optical rotary encoder. 4,639,595, Cl. 250-231.0SE.
Okuda, Masakiyo; Ohnishi, Kazuyuki; and Mitsuyama, Akira, to Sharp Kabushiki Kaisha. Automatic duplex copying type copying apparatus. 4,639,125, Cl. 355-23.000.
Okumoto, Yutaka, to Japan Tobacco, Inc. Device for controlling contents of tobacco on cigarette machine. 4,638,817, Cl. 131-280.000.
Okuzono, Shuichi: *See*—
Sakanaka, Yasuhiro; and Okuzono, Shuichi, 4,639,508, Cl. 528-486.000.
Oleff, Werner; and Pape, Fritz G., to Oleff, Werner; and ASV Stubbe GmbH & Co KG, a part interest. Injection molded synthetic wheel. 4,639,046, Cl. 301-63.0PW.
Olesen, Ole V., to Pace, Incorporated. Spike detector circuitry. 4,639,618, Cl. 307-351.000.
Olin Corporation: *See*—
Gasper, Kenneth E., 4,639,718, Cl. 340-603.000.
Meatto, Franklin D.; and Pilpel, Edward D., 4,639,009, Cl. 280-602.000.
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,638,535, Cl. 29-1.300.
Ollero-Pina, Juan C.; and Garrido-Diaz, Antonio, to Sociedad Anonima de Racionalizacion y Mechanizacion. Fruit selecting machine. 4,638,914, Cl. 209-617.000.
Ollivier, Jean: *See*—
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,639,429, Cl. 502-117.000.
Olsen, Randolffa R. Interlocking building block system. 4,639,345, Cl. 264-226.000.
Olson, Donald M., to Economic Development Corporation. High temperature and acid resistant wafer pick up device. 4,639,028, Cl. 294-34.000.
Olson, Douglas R.; Harness, James R.; and Waterston, John W., to Meloy Laboratories, Inc. Immunological color change test involving two differently colored reagent spots. 4,639,419, Cl. 435-5.000.
Olympus Optical Co., Ltd.: *See*—
Okada, Tsutomu, 4,638,802, Cl. 128-303.140.
Yokota, Akira, 4,639,837, Cl. 362-32.000.
Omata, Nobuaki, to Nifco Inc. Oil type damper. 4,638,528, Cl. 16-82.000.
Omholt, Bruce D., to Prints Plus, Inc. Drop feed mitering machine. 4,638,698, Cl. 83-444.000.
Omnichem S.A.: *See*—
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., 4,639,456, Cl. 514-283.000.
Omron Tateisi Electronics Co.: *See*—
Ishigure, Kazuaki, 4,638,746, Cl. 109-52.000.
Matsumoto, Hiromichi; and Hashimoto, Ritsuo, 4,639,889, Cl. 364-900.000.
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.
Sato, Ryuichi, 4,639,702, Cl. 335-153.000.
O'Neal, James E.: *See*—
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., 4,639,281, Cl. 148-407.000.
O'Neill Bell, Christopher: *See*—
MacLachlan, Stuart; and O'Neill Bell, Christopher, 4,638,555, Cl. 29-623.100.
Onystok, Michael J.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.

Oosawa, Masahiro: *See*—
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.
Oplatek Oy: *See*—
Sandgren, Lasse, 4,638,757, Cl. 118-411.000.
Optel System Limited: *See*—
Boles, John A.; and Eastman, Jay M., 4,639,606, Cl. 250-555.000.
Orii, Shingo: *See*—
Hara, Hajime; Orii, Shingo; Aoyama, Kazuho; and Enomoto, Masami, 4,639,503, Cl. 528-92.000.
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., to Armour Pharmaceutical Company. [16,19-Di-alanine] calcitonin. 4,639,509, Cl. 530-307.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., to Armour Pharmaceutical Company. (1-S-acetamidomethyl cysteine, 7-alanine)calcitonin. 4,639,510, Cl. 530-307.000.
Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Company. Des-19-leucine-calcitonin analogs. 4,639,511, Cl. 530-307.000.
Ortega, Domingo: *See*—
Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, 4,639,929, Cl. 373-120.000.
Ortho Pharmaceutical Corporation: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., 4,639,518, Cl. 544-285.000.
Osaka Gas Company Limited: *See*—
Iuchi, Akira; and Tsunokawa, Shinya, 4,638,975, Cl. 251-149.600.
Osaka University: *See*—
Komatsu, Masao; and Fujita, Hiroshi, 4,639,363, Cl. 423-644.000.
Osanai, Masatoshi: *See*—
Arikawa, Junichi; Chiba, Hiroshi; Miyazaki, Osamu; and Osanai, Masatoshi, 4,639,582, Cl. 235-379.000.
Oshima, Goro; and Kato, Kotaro, to NEC Corporation. Digital communication system including an error correcting encoder/decoder and a scrambler/descrambler. 4,639,548, Cl. 178-22.170.
Ostergren, Carl D.; and Paivanas, John A., deceased (by Paivanas, Sophia, executor), to International Business Machines Corporation. Thermal conduction disc-chip cooling enhancement means. 4,639,829, Cl. 361-386.000.
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, to Shikishima Canvas Kabushiki Kaisha; and Oji Seishi Kabushiki Kaisha. Method of controlling moisture profile in paper web in paper drying process and apparatus practicing same. 4,639,291, Cl. 162-207.000.
Ota, Toyokazu; and Nakamura, Yutaka, to Oji Seisha Kabushiki Kaisha; and Shikishima Casvas Kabushiki Kaisha. Drying cylinder for use in paper making. 4,639,292, Cl. 162-375.000.
Otobe, Yutaka, to Honda Giken Kogyo K.K. Method of detecting abnormality in a system for detecting exhaust gas ingredient concentration of an internal combustion engine. 4,638,658, Cl. 73-117.300.
Otobe, Yutaka; Kiuchi, Takeo; and Tomozawa, Kikuo, to Honda Giken Kogyo Kabushiki Kaisha; and Oki Denki Giken Kogyo Kabushiki Kaisha. Fuel supply control method for internal combustion engines, with adaptability to various engines and controls therefor having different operating characteristics. 4,639,870, Cl. 364-431.050.
O'Toole, Michael P.; and Card, Roger J., to American Cyanamid Company. High technology ceramics with partially stabilized zirconia. 4,639,356, Cl. 423-266.000.
Otsuka, Kengo: *See*—
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.
Ott, Karl-Heinz: *See*—
Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.
Ott, Russell G., to RCA Corporation. Priority arbitration logic for a multi-master bus system. 4,637,859, Cl. 364-200.000.
Otters, John L. External combustion engines. 4,638,633, Cl. 60-518.000.
Outboard Marine Corporation: *See*—
Hansen, Loren F.; and Lamb, Mark E., 4,638,867, Cl. 172-22.000.
Owen, David A. A.: *See*—
Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., 4,639,519, Cl. 544-320.000.
Owens-Corning Fiberglas Corporation: *See*—
Pugnale, Peter J.; and Messmer, Michael J., 4,639,164, Cl. 405-54.000.
Owens-Illinois, Inc.: *See*—
Beck, James M.; and Rohr, Robert D., 4,638,916, Cl. 215-235.000.
Oximetrix, Inc.: *See*—
Pastrone, Giovanni; and Chamness, Leland D., 4,639,245, Cl. 604-152.000.
Ozaki, Yukio: *See*—
Toda, Masumi; Ozaki, Yukio; and Nonaka, Shingo, 4,638,945, Cl. 239-143.000.
Pace, Incorporated: *See*—
Olesen, Ole V., 4,639,618, Cl. 307-351.000.
Paivanas, John A., deceased: *See*—
Ostergren, Carl D.; and Paivanas, John A., deceased, 4,639,829, Cl. 361-386.000.
Paivanas, Sophia, executor: *See*—
Ostergren, Carl D.; and Paivanas, John A., deceased, 4,639,829, Cl. 361-386.000.
Palecki, John: *See*—
Stetson, Karl A.; and Palecki, John, 4,639,593, Cl. 250-227.000.
Palensky, Frederick J.: *See*—
Rasmussen, Jerald K.; Heilmann, Steven M.; and Palensky, Frederick J., 4,639,286, Cl. 156-307.300.
Palm, Bernhard, to Milwaukee Electric Tool Corporation. Magnetic base for portable tools. 4,639,170, Cl. 408-76.000.
Palmer, Darrel, to Ballard Medical Products. Aspirating/ventilating apparatus and method. 4,638,539, Cl. 29-157.00R.
Panev, Vladimir B.: *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.
Panzera, Carlino: *See*—
Jones, Robin M. F.; DeLuca, Robert D.; and Panzera, Carlino, 4,639,218, Cl. 433-8.000.
Papak, Viktor, to Josef Gartner & Co. Apparatus for conditioning and controlling the temperature of rooms in a building. 4,638,853, Cl. 165-50.000.
Pape, Fritz G.: *See*—
Oleff, Werner; and Pape, Fritz G., 4,639,046, Cl. 301-63.0PW.
Papillon, Jean-Charles: *See*—
Richard, Philippe; Papillon, Jean-Charles; Guyot, Alain; and Corbellini, Carlo, 4,638,838, Cl. 138-30.000.
Pappano, Thomas W.; and Brown, David O., to General Signal Corporation. Apparatus for monitoring circuit integrity. 4,639,719, Cl. 340-652.000.
Paradyne Corporation: *See*—
Zuranski, Edward S.; Scott, Robert E.; and Betts, William L., 4,639,934, Cl. 375-10.000.
Park, Arthur; and Wilson, Bob T., to Diamond Oil Well Drilling Company. Core monitoring device. 4,638,872, Cl. 175-46.000.
Parker, Robert P.: *See*—
Tallant, James C., II; and Parker, Robert P., 4,639,785, Cl. 358-184.000.
Parracho, Rui M.; Smith, Lloyd S.; Bunch, Richard P.; and Gross, Alexander L., to Converse Inc. Athletic shoe with external counter and cushion assembly. 4,638,576, Cl. 36-68.000.
Pasquet, Veronique; and Spitz, Roger, to Atochem. Catalyst support, process for its manufacture, and catalysts prepared with this support. 4,639,430, Cl. 502-120.000.
Pastrone, Giovanni; and Chamness, Leland D., to Oximetrix, Inc. Fluid infusion pump driver. 4,639,245, Cl. 604-152.000.
Paterson, Noel S.; and Vermilion, Everette E., to Sundstrand Data Control, Inc. Excessive terrain closure warning system. 4,639,730, Cl. 340-970.000.
Paton, Charles R.: *See*—
Grunert, Kurt A.; Walker, Roger E.; Paton, Charles R.; and Leone, David A., 4,639,564, Cl. 200-144.00R.
Patrick, Fred: *See*—
Littwin, Kenneth M.; Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, 4,639,821, Cl. 361-151.000.
Pav, Josef; Rauf, Richard; Svenka, Peter; and Wenzel, Reinhard, to Kleinewefers GmbH. Method and apparatus for calendering magnetic tapes. 4,639,346, Cl. 264-280.000.
Pawson, Ian W. N.: *See*—
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.
Payne, Earl R., to ICI Americas Inc. Alarm packet system. 4,639,716, Cl. 340-571.000.
Payne, Thomas R., to General Electric Company. Temperature sensor failure detection system for cooking appliance. 4,639,578, Cl. 219-450.000.
Pearson, Michael J., to Kaiser Aluminum & Chemical Corporation. Promoted scavenger for purifying HCl-contaminated gases. 4,639,259, Cl. 55-71.000.
Pease, Donald L., to Xerox Corporation. Control for retracting the cleaning blade of a reproduction or printing machine when the machine is not in use. 4,639,122, Cl. 355-15.000.
Pedain, Josef: *See*—
Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, 4,639,499, Cl. 526-285.000.
Pehker, Manfred: *See*—
Heintz, Wolfgang; Pehker, Manfred; and Metz, Josef, 4,638,714, Cl. 89-37.010.
Peng, Tzy C.: *See*—
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., 4,639,281, Cl. 148-407.000.
Pennisi, Licio. Process for monitoring the heat gradient in a heat-producing system. 4,639,210, Cl. 431-13.000.
Peoples, P. Robert: *See*—
Hovey, Leonard L.; Mathews, Marion J., III; and Peoples, P. Robert, 4,639,539, Cl. 558-363.000.
Percell, Kim S., to Witco Chemical Corporation. Mold release enhancement for acrylonitrile-butadiene-styrene molding resins. 4,639,484, Cl. 524-318.000.
Periot, Jean-Marie: *See*—
Petit, Pierre; and Periot, Jean-Marie, 4,639,668, Cl. 324-208.000.
Perkey, Conrad G.: *See*—
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,638,846, Cl. 164-55.100.
Perrine, Neill D.: *See*—
Rogers, Russell L.; Perrine, Neill D.; and Alexander, Richard M., 4,639,016, Cl. 285-15.000.
Perry, Roger A. Tool carrier. 4,638,530, Cl. 24-3.00L.

Persch, Alois, to Zeller Plastik Koehn, Graebner & Co. Tamper proof closure. 4,638,917, Cl. 215-252.000.

Persson, Eric G.; and Veith, Ronald D., to GTO Electronics. Voltage inverter. 4,639,845, Cl. 363-26.000.

Peters, Arthur, to Honeywell Information Systems Inc. Wrap-around logic for interprocessor communications. 4,639,860, Cl. 364-200.000.

Petit, Pierre; and Periot, Jean-Marie, to La Telemecanique Electrique. Analog manipulator with proximity detection of a moveable magnetizable mass. 4,639,668, Cl. 324-208.000.

Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, to Odeco, Inc.; and Nippon Kokan, K.K. Deep water mobile submersible arctic structure. 4,639,167, Cl. 405-217.000.

Pezaris, Stylianos, to Thermo Electron Corporation. System for monitoring and controlling position of hoists. 4,639,874, Cl. 364-478.000.

Pezzoli, Nello, to Vamatex S.p.A. Guide for the gripper carrying straps inside the shed of weaving loom. 4,638,839, Cl. 139-449.000.

Pfaff Haushaltmaschinen GmbH: *See*—
Hartwig, Jurgen, 4,638,752, Cl. 112-458.000.

Pfizer Inc.: *See*—
Beck, Donald; Miller, James W.; Wernau, William C.; and Young, Thomas B., III, 4,639,322, Cl. 252-8.554.

Pham, Van Doan, to Alsthom-Atlantique. High tension arc-blast circuit breaker. 4,639,565, Cl. 200-148.00A.

Phelan, Gerard, to Swivelier. High hat light fixture support bracket. 4,638,970, Cl. 248-342.000.

Philip Morris Incorporated: *See*—
Cox, Richard H.; Grubbs, Harvey J.; and Haut, Stephen A., 4,638,816, Cl. 131-276.000.
Nichols, Walter A.; and Wayne, Reginald, 4,638,818, Cl. 131-281.000.

Phillips Home Products: *See*—
Bonacorsi, Robert W., 4,638,730, Cl. 100-229.00A.

Phillips Petroleum Company: *See*—
Lee, Fu-Ming, 4,639,308, Cl. 208-100.000.
Schuettenberg, Alexander D.; and Gragson, James T., 4,639,255, Cl. 44-62.000.

Phillips Plastics Corp.: *See*—
Wollar, Burnell J., 4,639,175, Cl. 411-38.000.

Piccirilli, Robert M.: *See*—
Makhlouf, Joseph M.; Falk, Frederick A.; and Piccirilli, Robert M., 4,639,492, Cl. 525-54.420.

Picquendar, Jean E.: *See*—
Yarranton, Arthur; Chase, Charles E., Jr.; and Picquendar, Jean E., 4,639,697, Cl. 333-155.000.

Pietsch, Helge: *See*—
Misher, Hans-Peter; and Pietsch, Helge, 4,638,982, Cl. 267-131.000.

Pike, Thomas W.: *See*—
Nye, Leroy M., Jr.; and Pike, Thomas W., 4,639,124, Cl. 355-15.000.

Pilarski, James A.: *See*—
Anderson, Robert L.; Pilarski, James A.; and Klintz, Jerry A., 4,639,653, Cl. 318-599.000.

Pilpel, Edward D.: *See*—
Meatto, Franklin D.; and Pilpel, Edward D., 4,639,009, Cl. 280-602.000.

Pinel, Joseph: *See*—
Val, Christian; Pinel, Joseph; and Gibod, Yves B., 4,639,826, Cl. 361-272.000.

Pinkham, Raymond: *See*—
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.

Pioneer Electronic Corporation: *See*—
Hasegawa, Tsunao, 4,639,681, Cl. 328-164.000.
Matsui, Fumio; Yanagisawa, Shuichi; Kakuta, Yoshiyuki; and Yoshizawa, Atsushi, 4,639,745, Cl. 346-135.100.
Yoshida, Masayuki, 4,639,660, Cl. 323-266.000.

Pistor, Helmut H., to United States of America, Army. IR image source using speculary reflective transparency. 4,639,603, Cl. 250-504.00R.

Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., to Raychem Limited. Recoverable article for screening. 4,639,545, Cl. 174-36.000.

Pitney Bowes Inc.: *See*—
Linkowski, William J., 4,639,918, Cl. 371-20.000.
Salazar, Edilberto I.; and Kirschner, Wallace, 4,638,732, Cl. 101-91.000.

Pittman, Clarence B.; and Cadwell, George H., Jr., to Flanders Filters, Inc. High efficiency air filter. 4,639,261, Cl. 55-502.000.

Pitts, John A. Z-neck, T-bar trailer. 4,639,015, Cl. 280-789.000.

Plastipak Packaging, Inc.: *See*—
Darr, Richard C., 4,639,206, Cl. 425-503.000.
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,639,207, Cl. 425-503.000.

Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased (by Jose Guiblain, Helene Christiane, Cecile Helene Laurence Lacour, Laurent Pierre Rolland Lacour, heirs), to Delalande S.A. Arylic derivatives of piperazine, the method of preparing same and their application in therapeutics. 4,639,452, Cl. 514-252.000.

Plus Development Corporation: *See*—
Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., 4,639,863, Cl. 364-200.000.

PMB Systems Engineering Limited: *See*—
Fern, Derek T., 4,639,166, Cl. 405-203.000.

Pockl, Franz: *See*—
Kellner, Roman; Mayr, Georg; Proksch, Karl-Heinz; and Pockl, Franz, 4,638,902, Cl. 198-345.000.

Podany, Clayton J.; and Glaseman, Richard W. Bow sight. 4,638,565, Cl. 33-265.000.

Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, to Agfa Gevaert Aktiengesellschaft. Electrostatographic suspension developer and a process for its preparation comprising quaternary ionic copolymer for positive toner charge. 4,639,403, Cl. 430-115.000.

Poggio, Cesare: *See*—
Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, 4,639,861, Cl. 364-200.000.

Pokorny, Richard J.: *See*—
Billigmeier, James E.; Groves, James D.; Haugen, Harwick A.; and Pokorny, Richard J., 4,639,483, Cl. 524-296.000.

Polaroid Corporation: *See*—
Hudspeth, William, 4,639,109, Cl. 354-295.000.

Polidor, Jaromir: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,639,570, Cl. 219-121.0PP.

Pollack, Robert L.; and Durst, Lawrence, to Commonwealth Medical Corporation of America. Method and composition for relieving pain. 4,639,465, Cl. 514-419.000.

Pommer, Ernst-Heinrich: *See*—
Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,639,447, Cl. 514-222.000.

Ponjee, Johannes J.; and Verwijlen, Christiaan J. A., to U.S. Philips Corporation. Method of providing a metal mirror on a surface manufactured from an acrylate synthetic resin or a methacrylate synthetic resin. 4,639,382, Cl. 427-162.000.

Pont-a-Mousson S.A.: *See*—
Souplet, Robert; and Sutter, Jean, 4,638,976, Cl. 251-173.000.

Porcher, Thomas C.; and Robinson, Morgan E., to Digital Equipment Corporation. Signals path control circuitry for a data terminal. 4,639,891, Cl. 364-900.000.

Posma, Bonne W. Four quadrant control of series motors. 4,639,647, Cl. 318-247.000.

Poss Design Limited: *See*—
Poss, Werner, 4,638,954, Cl. 241-74.000.

Poss, Werner, to Poss Design Limited. Apparatus for the separation of mixtures of materials of different consistencies such as meat and bone. 4,638,954, Cl. 241-74.000.

Posso, Patrick P. P., to Gefitec S.A. Drawer for a storage cabinet. 4,639,052, Cl. 312-333.000.

Post, Alexander: *See*—
Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, 4,639,163, Cl. 403-322.000.

Potel, Gerd; and Buchholz, Karl-Heinz, to MAN Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Vertically adjustable emergency support of a car body. 4,638,742, Cl. 105-199.300.

Potente, Daniel F.: *See*—
Potente, John E.; and Potente, Daniel F., 4,638,521, Cl. 15-111.000.

Potente, John E.; and Potente, Daniel F. Oral cleaning device. 4,638,521, Cl. 15-111.000.

Potter, Roger A. Positive lock mechanism for moving board. 4,639,003, Cl. 280-5.240.

Poulin, Ted M.: *See*—
Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., 4,638,855, Cl. 165-101.000.

Powell, Philip E., to Advanced Cardiovascular Systems, Inc. Self-venting balloon dilatation catheter and method. 4,638,805, Cl. 128-344.000.

Powers, Dale R., to Corning Glass Works. Optical fiber preform and method. 4,639,079, Cl. 350-96.330.

Poyser, John, to Armstrong Patents Co. Ltd. Shock absorbers. 4,638,896, Cl. 188-299.000.

PPG Industries, Inc.: *See*—
Das, Suryya K.; and Dowbenko, Rostyslaw, 4,639,394, Cl. 428-327.000.
Makhlouf, Joseph M.; Falk, Frederick A.; and Piccirilli, Robert M., 4,639,492, Cl. 525-54.420.

Precisionform, Inc.: *See*—
Coy, William H., 4,638,608, Cl. 52-98.000.

Press, Gerd: *See*—
Schuster, Heinz; and Press, Gerd, 4,639,155, Cl. 401-1.000.

Prettyjohns, Keith N.: *See*—
Wyant, James C.; and Prettyjohns, Keith N., 4,639,139, Cl. 356-359.000.

Preuschoff, Michael: *See*—
Becker, Kunibert; Kirchbrucher, Rudiger; and Preuschoff, Michael, 4,639,169, Cl. 405-291.000.

Price, William L.; Schlupp, Ronald L.; and Thomas, Mammen, to Advanced Micro Devices, Inc. Process for formation of trench in integrated circuit structure using isotropic and anisotropic etching. 4,639,288, Cl. 156-643.000.

Priebisch, Artwin: *See*—
Schneider, Gunther; and Priebisch, Artwin, 4,638,733, Cl. 101-114.000.

Priesnitz, Uwe: *See*—
Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,639,537, Cl. 558-48.000.

Prime Computer, Inc.: *See*—
Hogan, Thomas C.; and Adelman, Arnold, 4,639,936, Cl. 375-36.000.

Prince, Alfred M.; and Vnek, John, to New York Blood Center, Inc. Hepatitis B antigenic compositions and vaccines against hepatitis B derived therefrom. 4,639,371, Cl. 424-86.000.

Prince Corporation: *See*—
Marcus, Konrad H.; and Chu, Zooey C., 4,639,085, Cl. 350-283.000.

Princeton Polymer Laboratories: *See*—
Semarzadeh, Mohammad A., 4,639,396, Cl. 428-373.000.

Prints Plus, Inc.: *See*—
Omholt, Bruce D., 4,638,698, Cl. 83-444.000.

Process Equipment Company: *See*—
Knasel, Harold E.; and Grigsby, David A., 4,639,184, Cl. 414-730.000.

Procter and Gamble Company, The: *See*—
Barrat, Christian R.; Busch, Alfred; and Sardelis, Kosmas, 4,639,321, Cl. 252-8.800.
Bedenk, William T.; and Harden, Kendall L., 4,638,907, Cl. 206-0.500.
Tsai, Chee-Hway, 4,639,375, Cl. 426-49.000.

Prodi, Vittorio. Device for separating airborne particles into grain size classes. 4,639,311, Cl. 209-143.000.

Product Resources International, Inc.: *See*—
Mackles, Leonard, 4,639,367, Cl. 424-45.000.

Prohaska, Helmut, to Folienwalzwerk Brueder Teich Akitenesellschaft. Pack and process for the manufacture thereof. 4,638,911, Cl. 206-611.000.

Prokic-Immel, Ricardr: *See*—
Sehring, Richard; Buck, Wolfgang; Prokic-Immel, Ricarda; and Lust, Sigmund, 4,639,438, Cl. 514-129.000.

Proksch, Karl-Heinz: *See*—
Kellner, Roman; Mayr, Georg; Proksch, Karl-Heinz; and Pockl, Franz, 4,638,902, Cl. 198-345.000.

Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., to Olin Corporation. Apparatus for forming a thixoforged copper base alloy cartridge casing. 4,638,535, Cl. 29-1.300.

Puglis, John T.: *See*—
Purcell, John A.; Puglis, John T.; and Duckett, Steven W., 4,639,638, Cl. 313-534.000.

Pugnale, Peter J.; and Messmer, Michael J., to Owens-Corning Fiberglas Corporation. Underground tank sump and piping system. 4,639,164, Cl. 405-54.000.

Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel J.; and Kaluszynski, Michel, to Total Compagnie Francaise des Petroles. External apparatus for butt welding two pipes. 4,638,984, Cl. 269-43.000.

Pullan, Brian R. Apparatus for detecting and determining the distribution of radioactivity on a medium. 4,639,601, Cl. 250-385.000.

Pullen, Keats A., Jr. High sensitivity signal detector. 4,639,623, Cl. 307-492.000.

Puls, Walter: *See*—
Junge, Bodo; Krause, Hans P.; Muller, Lutz; and Puls, Walter, 4,639,436, Cl. 514-24.000.

Purcell, John A.; Puglis, John T.; and Duckett, Steven W., to Sangamo Weston, Inc. Photomultiplier dynode coating materials and process. 4,639,638, Cl. 313-534.000.

Purdue Frederick Company, The: *See*—
Shetty, Bola V.; McFadden, Arthur; and Hofer, Peter, 4,639,529, Cl. 548-550.000.

Puumalainen, Pertti, to Enso-Gutzeit Oy. Procedure for measuring the quantity of silicon coating on paper or cardboard. 4,639,942, Cl. 378-045.000.

Puydak, Robert C.: *See*—
Hazelton, Donald R.; and Puydak, Robert C., 4,639,487, Cl. 524-425.000.

Qaderi, Saiyed B. A.: *See*—
Dickie, Ray A.; and Qaderi, Saiyed B. A., 4,639,493, Cl. 525-113.000.

Quantum Corporation: *See*—
Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-73.000.

Quignard, Francoise: *See*—
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,639,429, Cl. 502-117.000.

Quock, Deborah E. R.; Triplett, Timothy L.; and Childress, Don E., to Texaco Inc. Filter press flow control system for dewatering sludge. 4,639,312, Cl. 210-101.000.

R. J. Reynolds Tobacco Company: *See*—
Roberts, Donald L.; Angel, Anthony L.; Clark, Douglas C.; Clearman, Jack F.; and Sink, T. Stephen, 4,638,820, Cl. 131-336.000.

Raby, James M.: *See*—
Brunea, Robert W.; and Raby, James M., 4,639,271, Cl. 106-21.000.

Racal Communications Equipment Limited: *See*—
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.

Rachwalski, Thaddeus M.: *See*—
Lindeman, Richard J.; and Rachwalski, Thaddeus M., 4,639,056, Cl. 339-17.0LC.

Rademakers, Petrus J., to Datawell B.V. Buoy. 4,639,227, Cl. 441-1.000.

Radenkov, Strahil K.: *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.

Rahn, Melanie H.; and Braun, Jane E., to Laporte, Dorothy, a part interest. Adult/child communication kit. 4,639,226, Cl. 434-433.000.

Railcar Specialties, Inc.: *See*—
Loomis, Russell M., 4,638,743, Cl. 105-377.000.

Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, to Omron Tateisi Electronics Co. Time-discrete adaptive switching on-off controller. 4,639,853, Cl. 364-149.000.

Ralph McKay Limited: *See*—
Johnson, William M.; and Mere, Ilmar, 4,638,868, Cl. 172-762.000.

Ramsey, Maynard, III; Medero, Richard; and Hood, Rush W., Jr., to Critikon, Inc. Automated diastolic blood pressure monitor with data enhancement. 4,638,810, Cl. 128-681.000.

Rand, Robert W. Medical apparatus for inducing scar tissue formation in a body. 4,638,803, Cl. 128-325.000.

Randall Industries: *See*—
Truckenbrodt, Randall, 4,639,031, Cl. 296-24.00R.

Randar, Magnus; and Kroening, Terry R., to Artos Engineering Company. Adjustably positional crank pin support means for wire feeding apparatus. 4,638,904, Cl. 198-468.200.

Rao, Kandukuri S. B.: *See*—
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., 4,639,456, Cl. 514-283.000.

Rasmussen, Jerald K.; Heilmann, Steven M.; and Palensky, Frederick J., to Minnesota Mining and Manufacturing Company. Curable compositions containing azlactone-functional compounds. 4,639,286, Cl. 156-307.300.

Rassieur, Charles L., to Central Mine Equipment Company. Earth drill rig. 4,638,871, Cl. 173-26.000.

Rauf, Richard: *See*—
Pav, Josef; Rauf, Richard; Svenka, Peter; and Wenzel, Reinhard, 4,639,346, Cl. 264-280.000.

Raute Oy: *See*—
Sinko, Hannu, 4,638,843, Cl. 144-350.000.

Ravi, Prasad S.: *See*—
Valenty, Vivian B.; Hill, William H.; and Ravi, Prasad S., 4,639,325, Cl. 252-89.100.

Raychem Corporation: *See*—
Cherian, Gabe, 4,639,818, Cl. 361-106.000.
Lionnet, Richard, 4,639,060, Cl. 339-30.000.
McMills, Corey J.; and Milroy, James C., 4,639,068, Cl. 339-177.00R.

Raychem Limited: *See*—
Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., 4,639,545, Cl. 174-36.000.

Raymond, William J.; Morgan, Robert L.; and Miller, Ricky L., to Jostens Learning Systems, Inc. Phrase-programmable digital speech system. 4,639,877, Cl. 364-513.500.

Raytheon Company: *See*—
Skow, Lawrence H., 4,639,644, Cl. 315-382.000.
Yarranton, Arthur; Chase, Charles E., Jr.; and Picquendar, Jean E., 4,639,697, Cl. 333-155.000.

RCA Corporation: *See*—
Basile, Philip C., 4,639,614, Cl. 307-243.000.
Butterwick, Gilbert N., 4,639,590, Cl. 250-213.0VT.
Cohen, Edward; Weaver, Clarence M., Jr.; and Duschl, Robert A., 4,639,775, Cl. 358-106.000.
Curtice, Walter R., 4,639,752, Cl. 357-16.000.
Fling, Russell T., 4,639,783, Cl. 358-166.000.
Fling, Russell T., 4,639,784, Cl. 358-167.000.
Hurst, Robert N., 4,639,773, Cl. 358-105.000.
Mawhinney, Daniel D., 4,638,808, Cl. 128-653.000.
Michaelis, Theodore D., 4,639,883, Cl. 364-557.000.
Neilson, John M. S.; and Brackelmanns, Norbert W., 4,639,762, Cl. 357-23.800.
Ott, Russell G., 4,639,859, Cl. 364-200.000.
Sauer, Donald J., 4,639,898, Cl. 365-202.000.
Schiff, Leonard N., 4,639,932, Cl. 375-1.000.
Tallant, James C., II; and Parker, Robert P., 4,639,785, Cl. 358-184.000.
Tamer, Gregory G.; and Hollinden, David E., 4,639,786, Cl. 358-197.000.
Wacyk, Ihor T., 4,639,897, Cl. 365-200.000.
Wheatley, Carl F., Jr.; Neilson, John M. S.; and Russell, John P., 4,639,754, Cl. 357-23.400.
Willis, Donald H.; and Fling, Russell T., 4,639,763, Cl. 358-11.000.
Willis, Donald H., 4,639,780, Cl. 358-150.000.

Re, Cesare: *See*—
Giannetti, Anna; Massa, Sergio; and Re, Cesare, 4,638,580, Cl. 40-503.000.

Rebhan, Horst: *See*—
Schneider, Gunther; and Priebisch, Artwin, 4,638,733, Cl. 101-114.000.

Redmann, Eckhard, to Kraftwerk Union Aktiengesellschaft. Sample-collecting device for gaseous or vaporous condensable radioactive substances, especially for collecting traces of tritium. 4,638,674, Cl. 73-863.120.

Redolfi, Michel. Underwater sound delivery system. 4,639,903, Cl. 367-131.000.

Redwine, Donald J.: *See*—
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.

Redyref-Pressed & Welded, Inc.: *See*—
Rosa, Frank, 4,638,605, Cl. 52-28.000.

Reell Precision Manufacturing Corp.: *See*—
Kossett, John A., 4,638,899, Cl. 192-81.00C.

Regel, Erik: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.

Rehm, Hans: *See—*
Bauch, Helmut; and Rehm, Hans, 4,639,613, Cl. 307-241.000.

Reichardt, Manfred; and Schutzle, Gunter, to Allied Corporation. Connector for a shielded flat cable. 4,639,053, Cl. 339-14.00R.

Reichert, Gerhard; and Riedel, Friedrich, to Siemens Aktiengesellschaft. Fan wheel for radial fan. 4,639,193, Cl. 416-184.000.

Reinecke, Paul: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.

Remy, David C., to Merck & Co., Inc. Benzocycloheptapyridone compounds for treating congestive heart failure. 4,639,457, Cl. 514-290.000.

Renard, Pierre: *See—*
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,639,354, Cl. 422-140.000.

Rentel, Kurt R.: *See—*
Saller, Kenneth R.; and Rentel, Kurt R., 4,639,685, Cl. 330-263.000.

Research Corporation: *See—*
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.

Research Medical, Inc.: *See—*
Kelly, Michael N.; Foster, John B.; and Foster, Robert D., 4,639,252, Cl. 604-282.000.

Research Physics, Inc: *See—*
Michel, Thomas J., 4,638,800, Cl. 128-303.100.

Reubke, Karl-Julius: *See—*
Lantzsch, Reinhard; and Reubke, Karl-Julius, 4,639,527, Cl. 548-262.000.

Reutter, Anneliese: *See—*
Staiger, Gerhard; Selmayr, Tassilo; Kinzel, Peter; and Reutter, Anneliese, 4,639,541, Cl. 560-20.000.

Revlon, Inc.: *See—*
Claudelli, Joseph P., 4,639,369, Cl. 424-59.000.

Reynes, Enrique G.; and Leising, John O., to B F Goodrich Company, The. Process for stabilizing thiocarbamylsulfenamides. 4,639,517, Cl. 544-85.000.

Rheinmetall GmbH.: *See—*
Bisping, Bernhard; and Bornefeld, Klaus, 4,638,738, Cl. 102-516.000.
Heintz, Wolfgang; Pehker, Manfred; and Metz, Josef, 4,638,714, Cl. 89-37.010.

Rhodes, Arthur B. Device for selectively coupling a movable load bearing unit to a link chain conveyor flight. 4,638,740, Cl. 104-172.200.

Rhone-Poulenc Agrochimie: *See—*
Linares, Hubert, 4,639,538, Cl. 558-71.000.

Riberi, Bernd: *See—*
Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, 4,639,499, Cl. 526-285.000.

Ribrant, Sven, to Allmanna Brandreskapsaffaren AB. Hose clamp. 4,638,531, Cl. 24-274.00R.

Rice, Ivan G. Process for directing a combustion gas stream onto rotatable blades of a gas turbine. 4,638,628, Cl. 60-39.020.

Richard Kablitz GmbH & Co. KG: *See—*
Weiss, Manfred, 4,638,905, Cl. 198-774.000.

Richard, Philippe; Papillon, Jean-Charles; Guyot, Alain; and Corbellini, Carlo, to Commissariat a l'Energie Atomique. Hydropneumatic accumulator. 4,638,838, Cl. 138-30.000.

Richard Wolf GmbH: *See—*
Riedlinger, Rainer, 4,639,904, Cl. 367-140.000.

Richter, Roland; Muller, Hanns P.; and Wegner, Christian, to Bayer Aktiengesellschaft. Material for support dressings. 4,638,795, Cl. 128-90.000.

Richter, Rudolf: *See—*
Norskau, Jurgen; and Richter, Rudolf, 4,639,195, Cl. 417-216.000.

Richter, Wolfgang: *See—*
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.

Rickert, Robert G.: *See—*
Amelio, William J.; Hume, David W.; McBride, Donald G.; and Rickert, Robert G., 4,639,380, Cl. 427-97.000.

Ricoh Company, Ltd.: *See—*
Anderson, Carl P., 4,639,128, Cl. 355-75.000.
Inoue, Takashi, 4,639,741, Cl. 346-76.0PH.
Kiguchi, Masao, 4,639,553, Cl. 379-377.000.
Murai, Kazuo; and Koichi, Yasushi, 4,639,117, Cl. 355-14.00R.
Sakurai, Yasuo, 4,638,987, Cl. 271-111.000.

Ricoh Systems, Inc.: *See—*
Anderson, Carl P., 4,639,128, Cl. 355-75.000.

Riebel, Hans-Jochem: *See—*
Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,639,537, Cl. 558-48.000.

Riedel, Friedrich: *See—*
Reichert, Gerhard; and Riedel, Friedrich, 4,639,193, Cl. 416-184.000.

Riedlinger, Rainer, to Richard Wolf GmbH. Sonic transmitters. 4,639,904, Cl. 367-140.000.

Rieser, Robert L. Combination garment hanger. 4,638,931, Cl. 223-88.000.

Riesselmann & Sohn, Firma: *See—*
Seelhorst, Gottfried, 4,638,663, Cl. 73-313.000.

Riggs, Donnie E. Shoe with angular slotted midsole. 4,638,577, Cl. 36-114.000.

Riker Laboratories: *See—*
McQuinn, Roy L.; and Wade, James J., 4,639,445, Cl. 514-222.000.

Rinderle, Heinz: *See—*
Beckenbach, Walter; and Rinderle, Heinz, 4,639,686, Cl. 330-307.000.

Ring, Stefan: *See—*
Forner, Siegfried; Katscher, Erich; and Ring, Stefan, 4,639,351, Cl. 376-310.000.

Rinn, Juergen; and Belitz, Fritz, to Minox GmbH. Automatic focusing system for a photographic camera. 4,639,110, Cl. 354-403.000.

Rinnai Kabushiki Kaisha: *See—*
Ueki, Takashi; and Ishikawa, Yoshihiro, 4,638,789, Cl. 126-351.000.

Ripberger, Emil; and Stuska, Gotthard, to Mahle GmbH. Light alloy piston. 4,638,725, Cl. 92-237.000.

Rippingale, John B., to Schonstedt Instrument Company. Apparatus and method employing extraneous field compensation for locating current-carrying objects. 4,639,674, Cl. 324-326.000.

Ritenour, Roger L.: *See—*
Rympalski, William P.; Herstein, James S.; and Ritenour, Roger L., 4,639,720, Cl. 340-712.000.

Ritter, Joachim A.: *See—*
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.

Ritter, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Aerobically hardenable plastic compositions. 4,639,498, Cl. 526-196.000.

Rivero, Mauricio. Plant transporting device. 4,638,595, Cl. 47-39.000.

Rizk, Nabil I.; and Stevens, Charles L., to Rizk, Nabil I. Implantable electrophoretic pump for ionic drugs and associated methods. 4,639,244, Cl. 604-19.000.

Roba, Joseph L.: *See—*
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Robbins & Myers, Inc.: *See—*
Baumgardner, Terry A.; Krouse, Jere L.; and Wild, Alan G., 4,639,200, Cl. 418-48.000.

Robert Bosch GmbH: *See—*
Buchner, Norbert; Lemke, Kuno; and Vogele, Gunter, 4,638,925, Cl. 222-21.000.
Gressler, Walter; and Kern, Karl, 4,639,185, Cl. 414-733.000.
Kubach, Hans; and Rupp, Hartmann, 4,639,822, Cl. 361-155.000.

Roberts, Donald L.; Angel, Anthony L.; Clark, Douglas C.; Clearman, Jack F.; and Sink, T. Stephen, to R. J. Reynolds Tobacco Company. Puff control cigarette. 4,638,820, Cl. 131-336.000.

Roberts, Gary F.: *See—*
Woodworth, Gary C.; and Roberts, Gary F., 4,638,729, Cl. 99-450.600.

Roberts, Thomas G.; and Honeycutt, Thomas E., to United States of America, Army. Sphericon. 4,639,642, Cl. 315-39.000.

Robertson, Charles M. Curling brooms. 4,638,522, Cl. 15-160.000.

Robinson, Morgan E.: *See—*
Porcher, Thomas C.; and Robinson, Morgan E., 4,639,391, Cl. 364-900.000.

Robroy Industries: *See—*
Ford, James H., 4,638,966, Cl. 248-62.000.

Rockwell International Corporation: *See—*
Chow, Pei-Ming D.; and Chi, Keh-Fei C., 4,639,142, Cl. 356-372.000.
Jaqua, Vance W.; and Jencek, Premysl, 4,638,947, Cl. 239-265.430.
Rosman, Irwin E., 4,639,189, Cl. 415-115.000.
Sheem, Sang K., 4,639,078, Cl. 350-96.210.
Yarne, Andrew J.; and Burr, Eldon F., 4,638,938, Cl. 228-180.100.

Roda, Dominick A., to Roda Industries, Inc. Removable shoe protector. 4,638,574, Cl. 36-7.200.

Roda Industries, Inc.: *See—*
Roda, Dominick A., 4,638,574, Cl. 36-7.200.

Rodi, Anton: *See—*
Blasius, Udo; and Rodi, Anton, 4,639,727, Cl. 340-825.570.

Rodloff, Rudiger K.; and Jungbluth, Werner W., to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Piezoceramic servo-drive for producing translational motion, especially for application to ring laser mirrors. 4,639,630, Cl. 310-328.000.

Rodriguez, Charles W.: *See—*
Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., 4,639,919, Cl. 371-27.000.

Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Azolylnitriles, and fungicides containing these compounds. 4,639,447, Cl. 514-222.000.

Rogers Corporation: *See—*
Frayer, Paul D., 4,639,485, Cl. 524-378.000.

Rogers, O. David; Bardwick, John, III; and Staten, Kenneth, to Stage Rite Corporation. Staging structure. 4,638,604, Cl. 52-6.000.

Rogers, Russell L.; Perrine, Neill D.; and Alexander, Richard M., to Aeroquip Corporation. Pipeline repair kit. 4,639,016, Cl. 285-15.000.

Rogers, Russell L.: *See—*
Hawley, Frank D.; and Rogers, Russell L., 4,638,842, Cl. 141-302.000.

Rohr, Robert D.: *See—*
Beck, James M.; and Rohr, Robert D., 4,638,916, Cl. 215-235.000.

ROJ Electrotex S.p.A.: *See*—
Ghiardo, Fiorenzo; and Maina, Bruno, 4,638,840, Cl. 139-452.000.
Rolls-Royce Limited: *See*—
Hall, John M., 4,638,946, Cl. 239-265.330.
Rombout, Willy. Method and equipment for electronically transmitting informations. 4,639,913, Cl. 370-90.000.
Romeo, Aurelio: *See*—
della Valle, Francesco; and Romeo, Aurelio, 4,639,437, Cl. 514-54.000.
Romer, Michael: *See*—
Krause, Joachim; Romer, Michael; and Weber, Georg, 4,639,328, Cl. 252-299.610.
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., to Continental Pharma Inc. Derivatives of glycinamide, their preparation and their use. 4,639,468, Cl. 514-620.000.
Ronthaler, Karl-Heinz: *See*—
Frings, Heinz; Kabelitz, Hans-Peter; and Ronthaler, Karl-Heinz, 4,639,199, Cl. 418-3.000.
Rorig, Kurt J.: *See*—
Desai, Bipinchandra N.; Chorvat, Robert J.; and Rorig, Kurt J., 4,639,524, Cl. 546-229.000.
Rorije, Gerhardus J.: *See*—
Bakker, Gijsbertus; and Rorije, Gerhardus J., 4,639,636, Cl. 313-408.000.
Rosa, Frank, to Redyref-Pressed & Welded, Inc. Mounting mechanism for connecting light box to telephone enclosure. 4,638,605, Cl. 52-28.000.
Rosbeck, Joseph P.; and Kasai, Ichiro, to Santa Barbara Research Center. Graded gap inversion layer photodiode array. 4,639,756, Cl. 357-30.000.
Rose, Bernard F., to Chevron Research Company. Fungicidal substituted N-(1-iodopropargyl)thiazolidinones. 4,639,460, Cl. 514-369.000.
Rosemount Inc.: *See*—
Brown, Gregory C.; and Gravel, James L., 4,638,830, Cl. 137-83.000.
Rosman, Irwin E., to Rockwell International Corporation. Hollow, thermally-conditioned, turbine stator nozzle. 4,639,189, Cl. 415-115.000.
Rosner, Manfred; Loewe, Heinz; Duwel, Dieter; and Kirsch, Reinhard, to Hoechst Aktiengesellschaft. Substituted phenylsulfonyloxybenzimidazolecarbamates and anthelmintic compositions. 4,639,463, Cl. 514-395.000.
Ross, Hugh M.: *See*—
Collinson, Christopher D.; and Ross, Hugh M., 4,638,950, Cl. 239-551.000.
Rota-Flex Corporation: *See*—
Lively, Gordon R.; and Lang, Jerry M., 4,638,676, Cl. 74-31.000.
Rousseau, Jacques R., to Aerazur-Efa. Maneuverable parachute. 4,638,961, Cl. 244-142.000.
Roussel Uclaf: *See*—
Jouquey, Alain; Salmon, Jean; Mouren, Michel; and Touyer, Gaetan, 4,639,336, Cl. 260-397.500.
Roy, Joseph A.: *See*—
Taubner, Fred R.; and Roy, Joseph A., 4,639,637, Cl. 313-489.000.
Roy, Leon E.: *See*—
Schellstede, Herman J.; and Youngblood, James F., 4,639,258, Cl. 55-52.000.
Roza, Engel; and Van Veenendaal, Hendrik G., to U. S. Philips Corporation. Head-end and receiver for a signal distribution system. 4,639,911, Cl. 370-69.100.
Rubin, Bruce A.: *See*—
Fleisher, Richard B.; and Rubin, Bruce A., 4,639,769, Cl. 358-27.000.
Rucci, Norman M.; and Sautter, Helmuth O., to AT&T Information Systems. Dynamic gain adjuster for an image scanner. 4,639,781, Cl. 358-163.000.
Ruhmer, Heinz: *See*—
Leineweber, Gunter; Warnecke, Rolf; and Ruhmer, Heinz, 4,638,719, Cl. 91-373.000.
Ruksznis, Ronald E.: *See*—
Westhaver, Lawrence A.; and Ruksznis, Ronald E., 4,639,655, Cl. 320-14.000.
Rullier, Pierre, to Salomon S.A. Safety ski binding. 4,639,011, Cl. 280-628.000.
Rung, Robert; and Ache, Lani G., to Victaulic Company of America. Self-adjusting pipe clamp and coupling. 4,639,020, Cl. 285-367.000.
Rupp, Hartmann: *See*—
Kubach, Hans; and Rupp, Hartmann, 4,639,822, Cl. 361-155.000.
Russell, John P.: *See*—
Wheatley, Carl F., Jr.; Neilson, John M. S.; and Russell, John P., 4,639,754, Cl. 357-23.400.
Rutledge, David L.: *See*—
Brannigan, Michael J.; and Rutledge, David L., 4,639,896, Cl. 365-200.000.
Ryback, Donald J.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.
Rycroft, Alan K., to Becton, Dickinson and Company. Syringe barrel and hypodermic needle assembly. 4,639,250, Cl. 604-201.000.
Ryder, Francis E., to Ryder International Corporation. Headband electrode system. 4,638,807, Cl. 128-644.000.
Ryder International Corporation: *See*—
Ryder, Francis E., 4,638,807, Cl. 128-644.000.
Rympalski, William P.; Herstein, James S.; and Ritenour, Roger L., to Harris Corporation. Electronic sketch pad. 4,639,720, Cl. 340-712.000.
S.r.l. LO.GI.CAM - Lombarda General Engeenering Costruzioni Automatiche: *See*—
Giannetti, Anna; Massa, Sergio; and Re, Cesare, 4,638,580, Cl. 40-503.000.
S.T.Dupont: *See*—
Ainoz, Jean-Philippe, 4,639,214, Cl. 431-344.000.
Sabarino, Giampiero: *See*—
Sacconi, Luigi; Foa , Marco; Bencini, Elena; and Sabarino, Giampiero, 4,639,506, Cl. 528-212.000.
Sacconi, Luigi; Foa , Marco; Bencini, Elena; and Sabarino, Giampiero, to Montedison S.p.A. Process for preparing polyphenylenethers. 4,639,506, Cl. 528-212.000.
Sadek, Kadry: *See*—
Dahler, Peter; Neidhart, Peter; Sadek, Kadry; and Stemmler, Herbert, 4,639,846, Cl. 363-39.000.
Sagara, Minoru: *See*—
Kurihara, Haruki; Sagara, Minoru; Matumoto, Kenji; and Tamura, Hideo, 4,639,925, Cl. 372-46.000.
Sage, Burton H., Jr., to Becton, Dickinson and Company. Fluorescent gram stain. 4,639,421, Cl. 435-34.000.
Sagues, Paul, to Berkeley Process Control, Inc. Method and apparatus for measuring velocity and position in servo systems. 4,639,884, Cl. 364-565.000.
Sahara, Masayoshi: *See*—
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,639,112, Cl. 354-455.000.
Saijo, Yoshihiko: *See*—
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,638,549, Cl. 29-564.400.
Sairenji, Michihiko. Tooth clamp. 4,639,221, Cl. 433-139.000.
Saito, Kazuta: *See*—
Ando, Masatoshi; Mochizuki, Hiromine; and Saito, Kazuta, 4,639,270, Cl. 106-21.000.
Saito, Kiyoshi: *See*—
Tajiri, Kazuhiro; Kohmoto, Michio; Saito, Kiyoshi; and Takahira, Hitoshi, 4,639,476, Cl. 523-213.000.
Saito, Masatoshi: *See*—
Imai, Akio; Okamoto, Yasushi; and Saito, Masatoshi, 4,639,494, Cl. 525-271.000.
Saito, Takashi: *See*—
Adachi, Hiroyuki; and Saito, Takashi, 4,639,123, Cl. 355-15.000.
Saito, Toshinori: *See*—
Aono, Koji; Saito, Toshinori; and Okada, Chiharu, 4,639,361, Cl. 423-347.000.
Sakaguchi, Yukihiko, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,639,414, Cl. 430-550.000.
Sakai, Kunihide, to Victor Company of Japan, Limited. Magnetic head for perpendicular magnetization. 4,639,810, Cl. 360-125.000.
Sakai, Shinji; Kawabata, Takashi; and Harada, Yoshihito, to Canon Kabushiki Kaisha. Code plate. 4,639,108, Cl. 354-289.100.
Sakai, Takami, to Kabushiki Kaisha Toshiba. Method and system for controlling an AC-DC converter system. 4,639,848, Cl. 363-51.000.
Sakai, Tuguyasu; Namba, Hideaki; and Ohba, Masahiro, to Nippondenso Co., Ltd. Glow plug heating control apparatus for a diesel engine. 4,639,871, Cl. 364-431.100.
Sakai, Yasuhito, to Fuji Jukogyo Kabushiki Kaisha. Hydraulic line pressure control system for an infinitely variable transmission. 4,638,689, Cl. 74-866.000.
Sakamoto, Satoshi, to Sony Corporation. Three-phase brushless motor. 4,639,648, Cl. 318-254.000.
Sakanaka, Yasuhiro; and Okuzono, Shuichi, to Toyo Soda Manufacturing Co., Ltd. Process for producing granular composition of ethylenethiourea-chloroprene rubber. 4,639,508, Cl. 528-486.000.
Sakashita, Mitsuaki: *See*—
Fujikawa, Yoshihiro; Sakashita, Mitsuaki; and Tsuruzoe, Nobutomo, 4,639,444, Cl. 514-222.000.
Sakazume, Akio; Yoshikawa, Hiroki; and Matsushima, Hiroaki, to Hitachi, Ltd. Control system for compressor motor used with air-conditioning unit. 4,638,643, Cl. 62-209.000.
Sakura, Yasuhiro, to Tokyo Electric Co., Ltd. Label feed control system. 4,639,287, Cl. 156-361.000.
Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, to Tokyo Electric Co., Ltd. Thermal printer. 4,639,743, Cl. 346-76.0PH.
Sakurada, Nobuaki; Kawamura, Hideaki; and Sasaki, Takashi, to Canon Kabushiki Kaisha. Recording head drive control apparatus. 4,639,747, Cl. 346-140.00R.
Sakurai, Yasuo, to Ricoh Company, Ltd. Automatic document feeder. 4,638,987, Cl. 271-111.000.
Saladino, Salvatore; and Samson, Victoria M. Ice cream handle. 4,639,376, Cl. 426-134.000.
Salazar, Edilberto I.; and Kirschner, Wallace, to Pitney Bowes Inc. Sheet handling apparatus. 4,638,732, Cl. 101-91.000.
Salestrom, Charles B.; and Anderson, Kenneth E. Modular lighting system. 4,639,841, Cl. 362-227.000.
Sailer, Kenneth R.; and Rentel, Kurt R., to Comlinear Corporation. Offset reduction in unity gain buffer amplifiers. 4,639,685, Cl. 330-263.000.
Salmon, Jean: *See*—
Jouquey, Alain; Salmon, Jean; Mouren, Michel; and Touyer, Gaetan, 4,639,336, Cl. 260-397.500.

Salomon S.A.: *See—*
Rullier, Pierre, 4,639,011, Cl. 280-628.000.
Salour, Michael M.; and Fehrenbach, Gustav W., to United States of America, Air Force. Distortion free fiber optic system. 4,639,075, Cl. 350-96.160.
Samejima, Ichiro: *See—*
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.
Samson, Victoria M.: *See—*
Saladino, Salvatore; and Samson, Victoria M., 4,639,376, Cl. 426-134.000.
Samtleben, Walter: *See—*
Schmidt, Baerbel; Samtleben, Walter; and Lysaght, Michael J., 4,639,243, Cl. 604-6.000.
Sandgren, Lasse, to Oplatek Oy. Apparatus for spreading jointing adhesive on a paper web which make one side of a form envelope. 4,638,757, Cl. 118-411.000.
Sandoz Ltd.: *See—*
Wenger, Roland; Traber, Rene P.; Kobel, Hans; and Hofmann, Hans, 4,639,434, Cl. 514-11.000.
Sangamo Weston, Inc.: *See—*
Purcell, John A.; Puglis, John T.; and Duckett, Steven W., 4,639,638, Cl. 313-534.000.
Swanson, Scott C., 4,639,728, Cl. 340-870.030.
San Ho, Fock: *See—*
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.
Sani-Fresh International, Inc.: *See—*
Bokmiller, David J., 4,638,910, Cl. 206-15.200.
Sankyo Company Limited: *See—*
Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, 4,639,441, Cl. 514-195.000.
Sankyo Manufacturing Co., Ltd.: *See—*
Kato, Heizaburo, 4,638,731, Cl. 100-282.000.
Kato, Heizaburo, 4,638,990, Cl. 271-272.000.
Kato, Heizaburo, 4,638,991, Cl. 271-272.000.
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, to Mitsui Toatsu Chemicals, Inc. Isoquinoline derivatives. 4,639,521, Cl. 546-141.000.
Sano Sharyo Seisakusho Co., Ltd.: *See—*
Maeda, Kazuya; and Ishihara, Yasusuke, 4,639,004, Cl. 280-5.320.
Sano, Yutaka: *See—*
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,639,088, Cl. 350-339.00F.
Sanshin Kogyo Kabushiki Kaisha: *See—*
Mori, Atsushi, 4,638,771, Cl. 123-73.0AD.
Santa Barbara Research Center: *See—*
Kera, Mark T.; and Shamordola, Kenneth A., 4,639,598, Cl. 250-339.000.
Rosbeck, Joseph P.; and Kasai, Ichiro, 4,639,756, Cl. 357-30.000.
Sanyo Denki Co. Ltd.: *See—*
Kurokawa, Kazuo; and Tanaka, Tadashi, 4,639,854, Cl. 364-157.000.
Sanyo Electric Co., Ltd.: *See—*
Mukai, Kiyotaka, 4,639,656, Cl. 320-22.000.
Shimizu, Yohei, 4,639,706, Cl. 336-170.000.
Sanyo-Kokusaku Pulp Company, Limited: *See—*
Kubo, Motonobu, 4,639,500, Cl. 526-301.000.
Sardelis, Kosmas: *See—*
Barrat, Christian R.; Busch, Alfred; and Sardelis, Kosmas, 4,639,321, Cl. 252-8.800.
Sasaki, Kiichi; and Takashi, Iimuro, to Honda Giken Kogyo Kabushiki Kaisha. Pivot structure for seat belt buckle. 4,638,534, Cl. 24-683.000.
Sasaki, Takashi: *See—*
Sakurada, Nobuaki; Kawamura, Hideaki; and Sasaki, Takashi, 4,639,747, Cl. 346-140.00R.
Sasano, Akiyoshi: *See—*
Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,638,751, Cl. 112-254.000.
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., to McDonnell Douglas Corporation. Advanced titanium composite. 4,639,281, Cl. 148-407.000.
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; and Dohi, Hideyuki, to Nippon Petrochemicals Company, Ltd. New electrical insulating oil and oil-filled electrical appliances. 4,639,833, Cl. 361-315.000.
Sato, Hidekazu, to Kokusan Kinzoku Kogyo Kabushiki Kaisha. Keyless steering shaft lock arrangement. 4,638,882, Cl. 180-287.000.
Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, to Kabushiki Kaisha Komatsu Seisakusho. Process for making foundry molds. 4,638,845, Cl. 164-12.000.
Sato, Kozo: *See—*
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,639,418, Cl. 430-617.000.
Sato, Osamu: *See—*
Tanaka, Kazumoto; Mashimo, Tohru; Sato, Osamu; and Kobayashi, Toyohiko, 4,639,868, Cl. 364-420.000.
Sato, Ryuichi, to Omron Tateisi Electronics Co. Reed relay. 4,639,702, Cl. 335-153.000.
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Rucci, Norman M.; and Sautter, Helmuth O., 4,639,781, Cl. 358-163.000.
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Sebastian, Wilhelm; Nickel, Wilhelm; and Schirmag, Klaus-Peter, 4,638,655, Cl. 72-208.000.
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Smallegan, Jon M., 4,639,026, Cl. 292-352.000.
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Weddigen, Gerd; Huber, Robert; Schmidt, Birgit; and Schneider, Hartmut, 4,639,496, Cl. 525-506.000.
Schmidt, Laurence J.: *See—*
Neubauer, Jerry L.; Schmidt, Laurence J.; and Voss, Steven H., 4,639,802, Cl. 360-98.000.
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Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, 4,639,499, Cl. 526-285.000.
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Schmidt, Robert R.: *See—*
Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,639,537, Cl. 558-48.000.
Schmitz, Beat: *See—*
Stahl, Peter H.; and Schmitz, Beat, 4,639,338, Cl. 260-502.50C.

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Schaible, Siegfried; and Schneble, Edwin, 4,638,623, Cl. 56-341.000.
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Weddigen, Gerd; Huber, Robert; Schmidt, Birgit; and Schneider, Hartmut, 4,639,496, Cl. 525-506.000.
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Kohler, Alfred; Schneider, Theodor; and Schubert, Karl F., 4,639,065, Cl. 339-119.00R.
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Schnupp, Dale L., 4,639,216, Cl. 432-105.000.
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Rippingale, John B., 4,639,674, Cl. 324-326.000.
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Schubert, Karl F.: *See*—
Kohler, Alfred; Schneider, Theodor; and Schubert, Karl F., 4,639,065, Cl. 339-119.00R.
Schubert & Salzer Maschinenfabrik: *See*—
Lovas, Kurt; and Deisinger, Franz, 4,638,625, Cl. 57-263.000.
Schuco Heinz Schurmann GmbH & Co.: *See*—
Tonsmann, Armin, 4,638,613, Cl. 52-235.000.
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Schulte, Winfred: *See*—
Baumers, Hans; Lietzke, Heinz; and Schulte, Winfred, 4,638,877, Cl. 180-21.000.
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Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.
Schuster, Heinz; and Press, Gerd, to USM Corporation. Melt dispensers. 4,639,155, Cl. 401-1.000.
Schutzle, Gunter: *See*—
Reichardt, Manfred; and Schutzle, Gunter, 4,639,053, Cl. 339-14.00R.
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Liu, King, 4,639,240, Cl. 474-144.000.
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Scipione, Donald S.: *See*—
Abraham, Joseph N.; and Scipione, Donald S., 4,639,875, Cl. 364-479.000.
SCM Corporation: *See*—
Turpin, Edward T.; and Thrane, David T., 4,639,299, Cl. 204-181.700.
Scott, Robert E.: *See*—
Zuranski, Edward S.; Scott, Robert E.; and Betts, William L., 4,639,934, Cl. 375-10.000.
Scullion, Christopher K.: *See*—
Baggarly, Brad A.; and Scullion, Christopher K., 4,639,873, Cl. 364-466.000.
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Sebata, Ichiro: *See*—
Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.
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Sehring, Richard; Buck, Wolfgang; Prokic-Immel, Ricarda; and Lust, Sigmund, to Celamerck GmbH & Co. KG. O,S-dialkyl-O-(substituted phenyl)-thiolphosphates as pesticides. 4,639,438, Cl. 514-129.000.
Seiko Instruments & Electronics Ltd.: *See*—
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,639,088, Cl. 350-339.00F.
Tamura, Fujio, 4,638,664, Cl. 73-384.000.
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Seki, Toshio: *See*—
Sekizawa, Sadao; Seki, Toshio; and Takahashi, Tadashi, 4,639,807, Cl. 360-113.000.
Sekiguchi, Akira: *See*—
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.
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Inaba, Mitsuharu; Sekiguchi, Takashi; Yoneyama, Yoshio; and Suzuki, Tadashi, 4,639,182, Cl. 414-543.000.
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Selin, Johan-Fredrik: *See*—
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,514, Cl. 536-30.000.
Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,515, Cl. 536-30.000.
Selleck, Ronald R.: *See*—
Martin, James M.; Brockett, William S.; Selleck, Ronald R.; and Croteau, Michael G., 4,639,138, Cl. 356-350.000.
Sellers, William Douglas: *See*—
Enders, Max L., deceased; and Thiel, Reinhard A., administrator, 4,639,044, Cl. 301-9.0DN.
Selmayr, Tassilo: *See*—
Staiger, Gerhard; Selmayr, Tassilo; Kinzel, Peter; and Reutter, Anneliese, 4,639,541, Cl. 560-20.000.
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Semtronics Corporation: *See*—
Breidegam, Albert C., 4,639,825, Cl. 361-212.000.
Sen Gupta, Sisir K., to Talon, Inc. Semi-automatic apparatus for attaching flypieces to a slide fastener chain. 4,638,557, Cl. 29-766.000.
Senoo, Yoji, to Sharp Kabushiki Kaisha. Device to prevent transport of poorly aligned copy paper. 4,638,989, Cl. 271-227.000.
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Lycan, Jennings, 4,639,558, Cl. 200-1.00V.
Seto, Kaoru, to Canon Kabushiki Kaisha. Motor control device. 4,639,649, Cl. 318-314.000.
Setoyama, Mikio: *See*—
Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, 4,638,845, Cl. 164-12.000.
Sewa, Shingo: *See*—
Aizawa, Koichi; Sewa, Shingo; and Nakahara, Hideki, 4,639,489, Cl. 524-588.000.
Sexton, Gregory J.: *See*—
Young, Lawrence R.; Sexton, Gregory J.; Mullins, Randal L.; and Bradley, Brian D., 4,639,738, Cl. 346-75.000.
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Seyler, Jay K.: *See*—
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,639,510, Cl. 530-307.000.
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Shaddock, Robert N.: *See*—
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.
Shallenberger, John M.; and Ferlan, Stephen J., to Westinghouse Electric Corp. Locking tube removal fixture and method in a reconstitutable fuel assembly. 4,638,543, Cl. 29-426.500.
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Kern, Mark T.; and Shamordola, Kenneth A., 4,639,598, Cl. 250-339.000.
Shand, J. Richard; and LaChance, Raymond H., to Bicron Electronics Company. Debris tolerant solenoid. 4,639,704, Cl. 335-255.000.
Shannon, John L., Jr. Singles stick for net height adjustment. 4,638,998, Cl. 273-29.0BB.
Shapiro, Rafael, to Du Pont de Nemours, E. I., and Company. Thiophene or furan herbicides. 4,639,265, Cl. 71-90.000.
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Akita, Kenji, 4,639,211, Cl. 431-20.000.
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.
Kira, Toru; Miyauchi, Teiichi; and Yoshikawa, Mitsuhiko, 4,639,806, Cl. 360-113.000.
Matsuura, Hirokazu, 4,639,120, Cl. 355-14.00R.
Okuda, Masakiyo; Ohnishi, Kazuyuki; and Mitsuyama, Akira, 4,639,125, Cl. 355-23.000.
Senoo, Yoji, 4,638,989, Cl. 271-227.000.
Taguchi, Toshimichi, 4,639,559, Cl. 200-5.00A.

Taniguchi, Koki; Yamaguchi, Shigeri; and Nakayama, Keiji, 4,639,062, Cl. 339-59.00M.
Ueno, Atsushi; and Abumi, Takao, 4,639,768, Cl. 358-22.000.
Washizuka, Isamu, 4,639,225, Cl. 434-308.000.

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Doherty, John A.; Ward, Billy W.; and Shaver, David C., 4,639,301, Cl. 204-192.310.

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Goolsby, Alvin D., 4,639,677, Cl. 324-425.000.
Wood, Derek A.; and Briner, Paul H., 4,639,334, Cl. 548-952.000.

Shemesh, Alvin: *See*—
Niazi, Sarfaraz; and Shemesh, Alvin, 4,639,368, Cl. 424-48.000.

Shen, Lawrence Y. L.: *See*—
Howard, Darryl A.; and Shen, Lawrence Y. L., 4,639,669, Cl. 324-239.000.

Shepler, Robert E.: *See*—
Ainsworth, John H.; and Shepler, Robert E., 4,639,388, Cl. 428-117.000.

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Shiba, Kenji: *See*—
Maejima, Takeshi; and Shiba, Kenji, 4,639,224, Cl. 434-286.000.

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Shibata, Noriyoshi: *See*—
Tamura, Toru; Shibata, Noriyoshi; and Kawakami, Toshiro, 4,639,148, Cl. 384-420.000.

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Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.

Shikishima Casvas Kabushiki Kaisha: *See*—
Ota, Toyokazu; and Nakamura, Yutaka, 4,639,292, Cl. 162-375.000.

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Yamamoto, Soichiro; and Shimada, Takeo, 4,639,409, Cl. 430-505.000.

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Furomoto, Yoshiyuki, 4,638,958, Cl. 242-84.10R.

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Fujita, Akira; and Shimizu, Kyoichi, 4,639,782, Cl. 358-166.000.

Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Electromagnetic servo device. 4,639,651, Cl. 318-432.000.

Shimizu, Yohei, to Sanyo Electric Co., Ltd. Flyback transformer. 4,639,706, Cl. 336-170.000.

Shimoda, Junji: *See*—
Yamamoto, Mitsuru; Watanabe, Kunio; and Shimoda, Junji, 4,639,735, Cl. 346-1.100.

Shimp, Alan B., to Westinghouse Electric Corp. Circuit breaker with interface flux shunt trip. 4,639,701, Cl. 335-21.000.

Shimura, Yukio: *See*—
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.

Shinagawa Refractories Co., Ltd.: *See*—
Toda, Masumi; Ozaki, Yukio; and Nonaka, Shingo, 4,638,945, Cl. 239-143.000.

Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Automatic focusing device with range boundary setting. 4,639,588, Cl. 250-201.000.

Shinonaga, Hirohiko: *See*—
Aoyama, Tsutomu; Nakamura, Taizo; Terao, Naoyosi; and Shinonaga, Hirohiko, 4,639,098, Cl. 350-514.000.

Shiojiri, Hiroyuki: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.

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Shoemaker, Lewis E.; and Bates, Thomas O., to Inco Alloys International, Inc. Welding electrode. 4,639,576, Cl. 219-146.230.

Shoemaker, Ralph A.: *See*—
Huggins, Raymond W.; and Shoemaker, Ralph A., 4,638,986, Cl. 271-98.000.

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Shoyo Engineering Company Limited: *See*—
Fukuda, Kazuichi, 4,639,237, Cl. 464-65.000.

Shulenberger, Art M.: *See*—
Chadwick, Curt H.; Shulenberger, Art M.; Taylor, John S.; and Simmons, Richard R., 4,639,587, Cl. 250-201.000.

Shulman, Mark L.: *See*—
Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., 4,639,919, Cl. 371-27.000.

Sibley, Howard W.: *See*—
Schoch, Stephen A.; and Sibley, Howard W., 4,639,594, Cl. 250-227.000.

Siemens Aktiengesellschaft: *See*—
Bauch, Helmut; and Rehm, Hans, 4,639,613, Cl. 307-241.000.
Behn, Reinhard, 4,639,832, Cl. 361-306.000.
Blaschke, Felix, 4,638,673, Cl. 73-862.170.
Brakus, Bogdan, 4,639,847, Cl. 363-46.000.
Brandner, Alois, 4,639,607, Cl. 250-561.000.
Diepers, Heinrich; and Schewe, Herbert, 4,639,811, Cl. 360-125.000.
Dolansky, Franz; and Steiner, Ewald, 4,639,820, Cl. 361-124.000.
Hartl, Christof; and Wagner, Hans, 4,639,556, Cl. 381-68.600.
Heinze, Udo; and Marhoff, Paul, 4,639,943, Cl. 378-96.000.
Meltsch, Hans-Jurgen, 4,639,546, Cl. 174-92.000.
Nirschl, Heinrich; Kamp, Klaus; and Stummer, Baldur, 4,639,909, Cl. 370-58.000.
Nussbaecher, Hans K., 4,639,888, Cl. 364-788.000.
Reichert, Gerhard; and Riedel, Friedrich, 4,639,193, Cl. 416-184.000.

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Spanswick, Keith A., 4,638,814, Cl. 128-804.000.

SIG Schweizerische Industrie-Gesellschaft: *See*—
Graf, Heinrich, 4,638,912, Cl. 206-621.000.

Sigl, Wayne C.; and Wolfson, Elizabeth A., to Kimberly-Clark Corporation. Device for dispensing individual sheets from an array of stacked sheets. 4,638,921, Cl. 221-1.000.

Sigri GmbH: *See*—
Kandzia, Ulrich, 4,639,930, Cl. 373-120.000.

Silicon Technology Corporation: *See*—
Steere, Robert; and Lewandowski, Thomas, 4,638,601, Cl. 51-165.710.

Simila, Eric J. Beverage container cooler. 4,638,645, Cl. 62-457.000.

Simjian, Luther G., to Command Automation, Inc. Exercise apparatus. 4,638,996, Cl. 272-146.000.

Simmons, Richard R.: *See*—
Chadwick, Curt H.; Shulenberger, Art M.; Taylor, John S.; and Simmons, Richard R., 4,639,587, Cl. 250-201.000.

Simon, Melvin H.: *See*—
Kujawa, Stephen M.; and Simon, Melvin H., 4,638,944, Cl. 237-8.00R.

Simonsen, Richard C.: *See*—
Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-73.000.

Simpson, Thomas W., to Solaronics, Inc. Confined spaced infrared burner system and method of operation. 4,639,213, Cl. 431-326.000.

Sims, Calvin L., to Winfield Laboratories, Inc. Method of dressing wounds. 4,638,796, Cl. 128-155.000.

Simtek Inc.: *See*—
Urwyler, Peter R., 4,638,696, Cl. 83-261.000.

Singer, Barry M.; and Jayaraman, Rajsekhar, to North American Philips Corporation. Combined bipolar-field effect transistor resurf devices. 4,639,761, Cl. 357-234.000.

Singer Company, The: *See*—
Koper, James G.; and Ljung, Bo H. G., 4,639,231, Cl. 445-31.000.

Sink, T. Stephen: *See*—
Roberts, Donald L.; Angel, Anthony L.; Clark, Douglas C.; Clearman, Jack F.; and Sink, T. Stephen, 4,638,820, Cl. 131-336.000.

Sinko, Hannu, to Raute Oy. Method for the manufacture of a veneer beam. 4,638,843, Cl. 144-350.000.

Sitabkhan, Mansur N.; and Mack, Raymond E., to Eaton Corporation. Caliper disc brake assembly. 4,638,894, Cl. 188-170.000.

Sitler, Wayne R.: *See*—
Hrustich, John; and Sitler, Wayne R., 4,639,856, Cl. 364-200.000.

SKF Industrial Trading & Development Company B. V.: *See*—
Bras, Johan Chr. M.; and Lankamp, Herman D., 4,639,149, Cl. 384-477.000.

Skinner, Geoffrey F., to Foster Wheeler Energy Corporation. Heat recovery system. 4,638,765, Cl. 122-7.00R.

Skipper, Richard S.: *See*—
Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., 4,639,545, Cl. 174-36.000.

Skokos, Peter G.; and Sobel, Alvin A. Combined form for visual matter, written descriptions and mailing envelopes. 4,638,940, Cl. 229-92.300.

Skow, Lawrence H., to Raytheon Company. High voltage dynamic focusing system. 4,639,644, Cl. 315-382.000.

Skudera, William J., Jr.: *See*—
Mariani, Elio A.; and Skudera, William J., Jr., 4,639,695, Cl. 333-133.000.

Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., to Plastipak Packaging, Inc. In-mold label dispenser for blow molding machine. 4,639,207, Cl. 425-503.000.

Slee, Roger H., to AE Plc. Manufacture of pistons. 4,638,694, Cl. 82-18.000.

Slimp, Jack B., Jr.: *See*—
Keska, Tadeusz W., 4,638,999, Cl. 273-258.000.

Sluyter, Erik; and Wooff, Edward A., Jr., to Circon Corporation. Focusable video camera for use with endoscopes. 4,639,772, Cl. 358-98.000.

Smallegan, Jon M., to Schlage Lock Company. Door knob and door knob catch arrangement. 4,639,026, Cl. 292-352.000.

Smith, Daniel W.: *See*—
Basinsky, Michael J.; Bird, Dale T.; and Smith, Daniel W., 4,638,971, Cl. 248-678.000.

Smith, David C. Safety roller assembly for bracket mounting to the top or rear face of rotary lawn mower deck. 4,638,622, Cl. 56-17.400.

Smith, Donald R., to King, Michael H., a part interest. Method and apparatus for isolation of hair from treatment materials. 4,638,821, Cl. 132-7.000.

Smith, Glenn C.; Needham, James R.; and Turnbull, William T. Truss plate. 4,639,176, Cl. 411-468.000.

Smith, Kent D.: *See*—
Murphy, Michael J.; and Smith, Kent D., 4,638,869, Cl. 172-821.000.

Smith Kline & French Laboratories Limited: *See*—
Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., 4,639,519, Cl. 544-320.000.

Smith, Lloyd B., to United Coal Company. Method for extracting water from solid fines or the like. 4,639,320, Cl. 210-739.000.

Smith, Lloyd S.: *See*—
Parracho, Rui M.; Smith, Lloyd S.; Bunch, Richard P.; and Gross, Alexander L., 4,638,576, Cl. 36-68.000.

Snow, Bennie E.: *See*—
Martens, Alan; and Snow, Bennie E., 4,638,630, Cl. 60-39.182.

Snyder, Robert G.: *See*—
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., 4,639,381, Cl. 427-156.000.

Snyder, Warren E., to Dresser Industries, Inc. Carburetion system for engines. 4,638,783, Cl. 123-527.000.

Snyder, Warren E.: *See*—
Fanner, John C.; and Snyder, Warren E., 4,638,777, Cl. 123-277.000.

Sobel, Alvin A.: *See*—
Skokos, Peter G.; and Sobel, Alvin A., 4,638,940, Cl. 229-92.300.

Sociedad Anonima de Racionalizacion y Mechanizacion: *See*—
Ollero-Pina, Juan C.; and Garrido-Diaz, Antonio, 4,638,914, Cl. 209-617.000.

Societe des Electrodes et Refractaires "Savoie" (SERS): *See*—
Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, 4,639,929, Cl. 373-120.000.

Societe d'Etudes, Recherche et Constructions Electroniques-Sercel: *See*—
Hullein, Francois; and Fribault, Gerard, 4,639,129, Cl. 356-5.000.

Societe d'Etudes Scientifiques et Industrielles de l'Ile de France: *See*—
Howie, Peter W.; and McNeilly, Alan, 4,639,439, Cl. 514-171.000.

Societe Francaise d'Ampoules Mecaniques: *See*—
Soulard, Dominique, 4,639,179, Cl. 414-223.000.

Societe Imphy S.A.: *See*—
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., 4,639,280, Cl. 148-404.000.

Societe Nationale des Poudres et Explosifs: *See*—
Lelu, Andre E.; Grignon, Jean R.; Gorthier, Bruno F.; and Tauzia, Jean-Michel, 4,638,735, Cl. 102-290.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." : *See*—
Debeneix, Pierre; and Tournere, Marcel J., 4,638,631, Cl. 60-226.300.
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., 4,639,280, Cl. 148-404.000.

Societe Nationale Elf Aquitaine: *See*—
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,639,429, Cl. 502-117.000.

Societe Nationale Industrielle Aerospatiale: *See*—
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,639,284, Cl. 156-213.000.

Societe Nouvelle Transfix: *See*—
Beisser, Jean-Claude, 4,638,554, Cl. 29-605.000.

Soeters, Raymond A., Jr., to Eaton Corporation. Supercharger assembly and rotor phasing fixture and method of partially assembling. 4,638,570, Cl. 33-562.000.

Soga, Junko: *See*—
Murashige, Yoshio; Yanagase, Akira; Kawachi, Yasunori; and Soga, Junko, 4,639,339, Cl. 260-513.600.

Solaronics, Inc.: *See*—
Simpson, Thomas W., 4,639,213, Cl. 431-326.000.

Solhjell, Erik, to Tandberg Data A/S. Arrangement for positioning a transducer to at least one track of a tape-shaped recording medium. 4,639,796, Cl. 360-77.000.

Soltesz, Richard G.: *See*—
Zimmer, John J.; and Soltesz, Richard G., 4,638,667, Cl. 73-432.100.

Sommer, Robert G.: *See*—
Lewandowski, Edward F.; Cassidy, Dale A.; and Sommer, Robert G., 4,639,571, Cl. 219-121.0EC.

Son, Pyong N.: *See*—
Lai, John T.; and Son, Pyong N., 4,639,479, Cl. 524-100.000.

Sone, Yoshiaki: *See*—
Misaki, Akira; Sone, Yoshiaki; and Kato, Takao, 4,639,516, Cl. 536-123.000.

Song, Kun K.: *See*—
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.

Sonntag, Michael: *See*—
Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, 4,639,499, Cl. 526-285.000.

Sony Corporation: *See*—
Aoki, Yoshio; and Tsukamura, Yoshihiro, 4,639,907, Cl. 369-45.000.
Hata, Katsuhiko; and Yamakami, Takahiko, 4,639,640, Cl. 315-3.000.
Hirayama, Shoji; and Inada, Mitsuharu, 4,639,549, Cl. 379-62.000.
Kusaka, Satoshi, 4,639,790, Cl. 358-293.000.
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.
Okanobu, Taiwa, 4,639,659, Cl. 323-224.000.
Sakamoto, Satoshi, 4,639,648, Cl. 318-254.000.
Urabe, Tetsuo; and Kojima, Shigeru, 4,639,722, Cl. 340-784.000.
Yamagawa, Masato; and Tsukada, Keizo, 4,639,550, Cl. 379-62.000.
Yamaguchi, Takashi; Nagasawa, Naomi; and Tamura, Hidemasa, 4,639,400, Cl. 428-694.000.

Soroi, Kazunori: *See*—
Nagato, Yoshio; and Soroi, Kazunori, 4,639,426, Cl. 501-96.000.

Soulard, Dominique, to Societe Francaise d'Ampoules Mecaniques. Device for loading a machine for the treatment, notably thermal, of cylindrical objects, notably in glass, such as glass pipes. 4,639,179, Cl. 414-223.000.

Souplet, Robert; and Sutter, Jean, to Pont-a-Mousson S.A. Rotary gate valve gasket and process for its manufacture. 4,638,976, Cl. 251-173.000.

South, William H.: *See*—
Cooper, John H.; and South, William H., 4,639,817, Cl. 361-62.000.

Southwestern Bell Telephone Company: *See*—
Bone, Ronald N., 4,639,555, Cl. 379-327.000.

Soutome, Kaoru: *See*—
Suematsu, Kazumi; Soutome, Kaoru; and Arakawa, Tatsumi, 4,639,297, Cl. 204-59.00F.

Sovacool, David K.; Van Slyke, Allan S.; and Bungo, Edward M., to General Motors Corporation. Grommet assembly. 4,638,964, Cl. 248-56.000.

Spanswick, Keith A., to Siemens Medical Laboratories. Electron accelerator unit for electron beam therapy. 4,638,814, Cl. 128-804.000.

Specht, Theodore R.: *See*—
Del Vecchio, Robert M.; and Specht, Theodore R., 4,639,610, Cl. 307-83.000.

Spector, George: *See*—
Braxton, Benjamin D.; and Spector, George, 4,639,654, Cl. 320-2.000.
Mines, Isaiah H., Jr.; and Spector, George, 4,638,923, Cl. 221-132.000.

Speights, Junius L.: *See*—
Chawla, Manmohan S.; and Speights, Junius L., 4,638,712, Cl. 89-1.150.

Sperinck, William A.; and Hall-Wilton, Michael J., to British Nuclear Fuels plc. Liquid sampling system. 4,638,675, Cl. 73-864.340.

Sperry Corporation: *See*—
Nelson, Alec L., 4,639,680, Cl. 328-134.000.

Spintzyk, Johannes: *See*—
Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, 4,638,962, Cl. 244-203.000.

Spitz, Roger: *See*—
Pasquet, Veronique; and Spitz, Roger, 4,639,430, Cl. 502-120.000.

Spock, Wayne R.; and Meisner, Richard P., to United Technologies Corporation. EMI suppression for electronic engine control frequency signal inputs. 4,639,885, Cl. 364-574.000.

Spotnitz, Robert M.: *See*—
Kreh, Robert P.; and Spotnitz, Robert M., 4,639,298, Cl. 204-59.00R.

Spotts, Kenneth: *See*—
De Bruine, Mark; and Spotts, Kenneth, 4,638,965, Cl. 248-59.000.

Sprecker, Mark A.; and Hanna, Marie R., to International Flavors & Fragrances Inc. Alkyl-substituted spirodecenone derivatives, organoleptic utility thereof and processes for preparing same. 4,639,330, Cl. 252-522.00R.

Square D Company: *See*—
Maulandi, Aymon A., 4,639,561, Cl. 200-33.00R.

Srinivasan, Viswanathan: *See*—
Michalski, Dennis H.; and Srinivasan, Viswanathan, 4,639,359, Cl. 423-321.00R.

SSAB Svenskt Stal AB: *See*—
Lindgren, Nils E., 4,638,831, Cl. 137-117.000.

Sta-Rite Industries, Inc.: *See*—
Marietta, Walter E., 4,638,886, Cl. 187-8.490.

Staab, Rudolf; Bergner, Dieter; and Hannesen, Kurt, to Hoechst Aktiengesellschaft. Electrolysis apparatus with horizontally disposed electrodes. 4,639,303, Cl. 204-258.000.

Staendeke, Horst: *See*—
Elsner, Georg; Staendeke, Horst; and Heymer, Gero, 4,639,331, Cl. 252-609.000.
Stage Rite Corporation: *See*—
Rogers, O. David; Bardwick, John, III; and Staten, Kenneth, 4,638,604, Cl. 52-6.000.
Stager, Wolfgang: *See*—
Wulf, Rudolf; and Stager, Wolfgang, 4,638,632, Cl. 60-319.000.
Stahl, Glenn L.: *See*—
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., 4,639,509, Cl. 530-307.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,639,510, Cl. 530-307.000.
Stahl, Peter H.; and Schmitz, Beat, to Ciba-Geigy Corporation; and Henkel Kommanditgesellschaft auf Aktien. Preparation of crystalline disodium 3-amino-1-hydroxypropane-1,1-diphosphonate pentahydrate. 4,639,338, Cl. 260-502.50C.
Stahlecker, Fritz; and Stahlecker, Hans, to Stahlecker, Fritz; and Stahlecker, Hans. Fiber feed channel arrangement for open end friction spinning machine. 4,638,626, Cl. 57-401.000.
Stahlecker, Hans: *See* —
Stahlecker, Fritz; and Stahlecker, Hans, 4,638,626, Cl. 57-401.000.
Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive compound, light-sensitive mixture, and light-sensitive copying material prepared therefrom with 0-naphthoquinone diazide compound. 4,639,406, Cl. 430-165.000.
Staiger, Gerhard; Seimayr, Tassilo; Kinzel, Peter; and Reutter, Anneliese, to Consortium für elektrochemische Industrie GmbH. Substituted phenylacetic acid iodopropargyl esters, biocidal agents containing same and process for manufacturing same. 4,639,541, Cl. 560-20.000.
Stamicarbon B.V.: *See*—
van der Stoel, Roland E., 4,639,525, Cl. 546-290.000.
Stamov, Vladimir P.: *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.
Standard-Knapp, Inc.: *See*—
Johnson, Lloyd D., 4,638,620, Cl. 53-382.000.
Standard Oil Company, The: *See*—
Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., 4,638,865, Cl. 166-274.000.
Warmack, Ralph E.; and Woodruff, William D., 4,639,901, Cl. 367-13.000.
Stansfield, Edward V.: *See*—
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.
State of Israel, Ministry of Defense, Armament: *See*—
Vishlizky, Yoram, 4,639,222, Cl. 434-20.000.
State of Isreal, The: *See*—
Glatt, Ilana; Livnat, Aminadav; and Kafri, Oded, 4,639,132, Cl. 356-124.500.
Staten, Kenneth: *See*—
Rogers, O. David; Bardwick, John, III; and Staten, Kenneth, 4,638,604, Cl. 52-6.000.
Steere, Robert; and Lewandowski, Thomas, to Silicon Technology Corporation. Automatic edge grinder. 4,638,601, Cl. 51-165.710.
Steers, Michel: *See*—
Hazan, Jean-Pierre; and Steers, Michel, 4,639,137, Cl. 356-339.000.
Stefancin, Ronald J., Jr. Three dimensional mirrored aquarium ornament. 4,639,101, Cl. 350-616.000.
Steimel, Johannes: *See*—
Weber, Berthold; Giesenberg, Peter; and Steimel, Johannes, 4,639,589, Cl. 250-203.00R.
Stein Industrie: *See*—
Fournier, Jean, 4,638,857, Cl. 165-162.000.
Steiner, Ewald: *See*—
Dolansky, Franz; and Steiner, Ewald, 4,639,820, Cl. 361-124.000.
Steinert, Hans-Jurgen: *See*—
Kahlert, Wolfgang; Klein, Joachim; Steinert, Hans-Jurgen; and Vorlop, Claus, 4,639,423, Cl. 435-287.000.
Stemmler, Herbert: *See*—
Dahler, Peter; Neidhart, Peter; Sadek, Kadry; and Stemmler, Herbert, 4,639,846, Cl. 363-39.000.
Stenberg, Bengt: *See*—
Edholm, Stig; and Stenberg, Bengt, 4,639,711, Cl. 338-114.000.
Stenzel, Otto, to Leybold-Heraeus GmbH. Method and apparatus for melting rod-shaped material with an induction coil. 4,639,567, Cl. 219-10.430.
Stephany, Christian: *See*—
Froelich, Hans; Hepperle, Willi; Katzer, Johann; and Stephany, Christian, 4,639,018, Cl. 285-184.000.
Stern, Donald J.; and Allsop, Jon I. Painting apparatus and method. 4,639,156, Cl. 401-146.000.
Stetson, Karl A.; and Palecki, John, to United Technologies Corporation. Airflow detection system using fiber optics. 4,639,593, Cl. 250-227.000.
Steup, Walter: *See*—
Hoppmanns, Rolf D.; Steup, Walter; Wieczorek, Willibald; and Beitler, Franz, 4,639,801, Cl. 360-96.500.
Stevens, Charles L.: *See*—
Rizk, Nabil I.; and Stevens, Charles L., 4,639,244, Cl. 604-19.000.
Stewart, E. Allen, III; and Keesling, Evan L., to Amasek, Inc. Method and system for processing aquatic plants. 4,638,621, Cl. 56-9.000.
Sticher, Charles K., to Nordson Corporation. Bridge circuit system. 4,639,611, Cl. 307-117.000.
Stoco Industries, Inc.: *See*—
Stoltz, J. Stephen, 4,638,922, Cl. 221-75.000.
Stoik, Richard D.: *See*—
Birum, Gail H.; Mathis, Thomas C.; and Stolk, Richard D., 4,639,480, Cl. 524-104.000.
Stoltz, J. Stephen, to Stoco Industries, Inc. Shake compensated hole-punched product vending system. 4,638,922, Cl. 221-75.000.
Stone Allen Limited: *See*—
George, Martin C. J., 4,638,767, Cl. 122-448.00B.
Stone, Wayne B., Jr., to Wood Manufacturing Co., Inc. Injection molded, self sealing top assembly for open mouth coffee pots. 4,638,929, Cl. 222-456.000.
Storage Technology Corporation: *See*—
Thornley, Richard, 4,639,808, Cl. 360-121.000.
Storm, Eric L., to Eaton Corporation. Method of providing variable reduction axle. 4,639,869, Cl. 364-424.100.
Strange, Thomas F.; and Carino, John W., to North American Philips Corporation. Pressure sensitive fault interrupter for a multi section AC capacitor. 4,639,827, Cl. 361-272.000.
Strange, Thomas F.; and Carino, John W., to North American Philips Corporation. Pressure sensitive fault current interrupter for multiple capacitor device. 4,639,828, Cl. 361-272.000.
Straube, Axel; and Loos, Hans, to Licentia Patent-Verwaltungs-GmbH. Method and apparatus for determining ice boundary temperature for the de-icing system of an aircraft. 4,638,960, Cl. 244-134.00D.
Stremmel, Gerd: *See*—
Czempik, Klaus; and Stremmel, Gerd, 4,639,326, Cl. 252-91.000.
Striebig AG: *See*—
Striebig, Ludwig, 4,638,695, Cl. 83-100.000.
Striebig, Ludwig, to Striebig AG. Board saw with sawdust exhaust. 4,638,695, Cl. 83-100.000.
Stroh, Paul F. Tremolo accessory. 4,638,711, Cl. 84-313.000.
Strosser, Richard P.; Bohman, Carl E.; and Chow, Mark K., to New Holland, Inc. Metal detector sensitivity adjustment and test assembly. 4,639,666, Cl. 324-202.000.
Studt, William L.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,639,442, Cl. 514-212.000.
Stummer, Baldur: *See*—
Nirschl, Heinrich; Kamp, Klaus; and Stummer, Baldur, 4,639,909, Cl. 370-58.000.
Sturdevant, Eugene J., to Harry Hill Associates. Electrodes for enhanced heat and mass transfer apparatus. 4,639,577, Cl. 219-399.000.
Stuska, Gotthard: *See*—
Ripberger, Emil; and Stuska, Gotthard, 4,638,725, Cl. 92-237.000.
Stypher Corporation, The: *See*—
Moxon, Edwin C., 4,639,792, Cl. 358-335.000.
Suematsu, Kazumi; Soutome, Kaoru; and Arakawa, Tatsumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluorinated graphites and a process for production thereof. 4,639,297, Cl. 204-59.00F.
Suganuma, Namio: *See*—
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.
Sugawara, Shinichi: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, 4,639,441, Cl. 514-195.000.
Sugaya, Toru: *See*—
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.
Sugimoto, Kenji, to Citizen Watch Co., Ltd. Bar stock feeder. 4,638,693, Cl. 82-2.500.
Sugimura, Yukio: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, 4,639,441, Cl. 514-195.000.
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, to Seiko Instruments & Electronics Ltd. Multi-color display device and process of fabricating same. 4,639,088, Cl. 350-339.00F.
Sugita, Hiroshi; Iwasa, Tadanobu; Yasukawa, Takemasa; and Aritake, Masanori, to Toyoda Goseki Co., Ltd. Wiper blade rubber. 4,638,525, Cl. 15-250.360.
Sugitani, Yuji; and Tamaoki, Naohiro, to Nippon Kokan Kabushiki Kaisha. Automatic groove tracing control method for arc welding. 4,639,573, Cl. 219-124.220.
Suling, Carlhans: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.
Sumida, Yuzo: *See*—
Kondo, Akihiro; Tsushima, Rikio; and Sumida, Yuzo, 4,639,491, Cl. 524-801.000.
Sumitomo Chemical Company, Limited: *See*—
Imai, Akio; Okamoto, Yasushi; and Saito, Masatoshi, 4,639,494, Cl. 525-271.000.
Ueno, Katsuji; Nagaoka, Kenji; Miyashita, Akira; and Ebisu, Satoshi, 4,639,344, Cl. 264-83.000.
Sumitomo Electric Industries, Ltd.: *See*—
Kodama, Mitsuo; Miyake, Masaya; Nakano, Minoi; Asai, Tsuyoshi; and Hara, Akio, 4,639,352, Cl. 419-15.000.

Sundstrand Corporation: *See*—
Swadley, Gerald L., 4,639,188, Cl. 415-9.000.
Sundstrand Data Control, Inc.: *See*—
Gradin, James H., 4,639,106, Cl. 353-13.000.
Paterson, Noel S.; and Vermilion, Everette E., 4,639,730, Cl. 340-970.000.
Surko, Walter E., Jr., to Yale Security Inc. Lock cylinder having two sets of tumblers and key therefor. 4,638,651, Cl. 70-364.00A.
Sutera, Richard, to Burlington Industries, Inc. Tensionable electrodes for charging and/or deflecting fluid droplets in fluid-jet marking apparatus. 4,639,737, Cl. 346-75.000.
Sutter, Jean: *See*—
Souplet, Robert; and Sutter, Jean, 4,638,976, Cl. 251-173.000.
Suzuki, Akio: *See*—
Honda, Chika; Suzuki, Akio; Machida, Katsutoshi; and Iwata, Masatoshi, 4,639,417, Cl. 430-567.000.
Suzuki, Hirosuke; Yasumoto, Hiromi; and Umemoto, Hiroshi, to Junkosha Company, Ltd. Strip line cable comprised of conductor pairs which are surrounded by porous dielectric. 4,639,693, Cl. 333-1.000.
Suzuki, Hisao: *See*—
Sato, Yoshiaki; and Suzuki, Hisao, 4,639,397, Cl. 428-397.000.
Suzuki, Kenji: *See*—
Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, 4,639,118, Cl. 355-29.000.
Suzuki, Motomu; and Asahina, Hiroshi, to Kabushiki Kaisha Toshiba. Digital fluoroscopy apparatus. 4,639,867, Cl. 364-414.000.
Suzuki, Niichiro; Oguahi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, to Shin-Etsu Chemical Co. Ltd. Heat-resistant flexible laminate for substrate of printed circuit board and a method for the preparation thereof. 4,639,285, Cl. 156-272.600.
Suzuki, Nobuo: *See*—
Yatabe, Toshiaki; Nishihara, Toshio; and Suzuki, Nobuo, 4,639,069, Cl. 350-1.700.
Suzuki, Norio, to NEC Corporation. Apparatus for detecting movement in a television signal based on taking ratio of signal representing frame difference to signal representing sum of picture element differences. 4,639,767, Cl. 358-21.00R.
Suzuki, Tadashi: *See*—
Inaba, Mitsuharu; Sekiguchi, Takashi; Yoneyama, Yoshio; and Suzuki, Tadashi, 4,639,182, Cl. 414-543.000.
Suzuki, Yoichi: *See*—
Moriizumi, Ryoji; Suzuki, Yoichi; and Ameda, Kazuhiro, 4,638,883, Cl. 180-324.000.
Suzumura, Masanaga: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.
Svenka, Peter: *See*—
Pav, Josef; Rauf, Richard; Svenka, Peter; and Wenzel, Reinhard, 4,639,346, Cl. 264-280.000.
Swadley, Gerald L., to Sundstrand Corporation. Turbine wheel containment. 4,639,188, Cl. 415-9.000.
Swanson, Scott C., to Sangamo Weston, Inc. Method of and system for accumulating verifiable energy demand data from remote electricity meters. 4,639,728, Cl. 340-870.030.
SWF Auto-Electric GmbH: *See*—
Kohler, Alfred; Schneider, Theodor; and Schubert, Karl F., 4,639,065, Cl. 339-119.00R.
Swivelier: *See*—
Phelan, Gerard, 4,638,970, Cl. 248-342.000.
Sytek, Inc.: *See*—
Gang, Joseph M.; and Bain, Mitchell B., 4,639,921, Cl. 371-53.000.
Szabo, Josef: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,639,570, Cl. 219-121.0PP.
Szina, Gabor: *See*—
Bader, Imre; Berecz, Endre; Szina, Gabor; and Horvath, Janos, 4,639,304, Cl. 204-413.000.
Tachikawa Spring Co., Ltd.: *See*—
Fujita, Yasuyuki; and Nishino, Takaichi, 4,639,040, Cl. 297-379.000.
Furukawa, Toshio, 4,639,041, Cl. 297-391.000.
Taguchi, Toshimichi, to Sharp Kabushiki Kaisha. Membrane keyboard. 4,639,559, Cl. 200-5.00A.
Tahara, Kazuo: *See*—
Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; Tajima, Fumio; and Tomite, Tosio, 4,639,625, Cl. 310-154.000.
Tahara, Yasuteru: *See*—
Koike, Kazuyoshi; and Tahara, Yasuteru, 4,639,130, Cl. 356-73.100.
Tahon, Bernard: *See*—
Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, 4,639,929, Cl. 373-120.000.
Taiho Kogyo Corporation, Ltd.: *See*—
Umemura, Hiroo, 4,638,568, Cl. 33-549.000.
Tajima, Fumio: *See*—
Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; Tajima, Fumio; and Tomite, Tosio, 4,639,625, Cl. 310-154.000.
Tajima, Hatsuo: *See*—
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.
Tajiri, Kazuhiro; Kohmoto, Michio; Saito, Kiyoshi; and Takahira, Hitoshi, to Nitto Electric Industrial Co., Ltd. Epoxy resin powder coating composition. 4,639,476, Cl. 523-213.000.
Takaba, Hiroaki: *See*—
Kobayashi, Akihiro; Yamaguchi, Shunzo; Kobayashi, Kiyomi; and Takaba, Hiroaki, 4,639,712, Cl. 338-238.000.
Takagi, Fumio: *See*—
Hanamoto, Keiji; and Takagi, Fumio, 4,639,341, Cl. 264-40.100.
Takagi, Tadashi: *See*—
Seino, Kiyoharu; Takagi, Tadashi; and Takeda, Fumio, 4,639,694, Cl. 333-128.000.
Takahashi, Noriyoshi: *See*—
Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; Tajima, Fumio; and Tomite, Tosio, 4,639,625, Cl. 310-154.000.
Takahashi, Sadatoshi: *See*—
Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,639,096, Cl. 350-427.000.
Takahashi, Sankichi: *See*—
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,638,646, Cl. 62-478.000.
Takahashi, Seiichi: *See*—
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.
Takahashi, Tadashi: *See*—
Sekizawa, Sadao; Seki, Toshio; and Takahashi, Tadashi, 4,639,807, Cl. 360-113.000.
Takahashi, Tohru; and Kurami, Kunihiko, to Nissan Motor Co., Ltd. Control system for robot manipulator. 4,639,652, Cl. 318-568.000.
Takahashi, Tomohiko, to Kabushiki Kaisha Toshiba. Method and apparatus for printing an image. 4,639,742, Cl. 346-76.0PH.
Takahira, Hitoshi: *See*—
Tajiri, Kazuhiro; Kohmoto, Michio; Saito, Kiyoshi; and Takahira, Hitoshi, 4,639,476, Cl. 523-213.000.
Takai, Kiyoaki: *See*—
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.
Takashi, Iimuro: *See*—
Sasaki, Kiichi; and Takashi, Iimuro, 4,638,534, Cl. 24-683.000.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,639,448, Cl. 514-226.000.
Takauji, Kiyomi: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, to Fujisawa Pharmaceutical Co., Ltd. 7-amino-3-[substituted vinyl]-3-cephem-4-carboxylates having antimicrobial activity. 4,639,448, Cl. 514-226.000.
Takayama, Hisao: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.
Takebe, Yoshiyuki: *See*—
Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, 4,638,624, Cl. 57-208.000.
Takeda, Fumio: *See*—
Seino, Kiyoharu; Takagi, Tadashi; and Takeda, Fumio, 4,639,694, Cl. 333-128.000.
Takeda, Shunichi: *See*—
Matsui, Takeshi; Takeda, Shunichi; and Makino, Tomoatsu, 4,638,785, Cl. 123-644.000.
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, to Hitachi, Ltd. Thin film magnetic head slider. 4,639,803, Cl. 360-103.000.
Takekoshi, Yoshitaka; and Ushiyama, Shigeyuki, to Fanuc Ltd. Interlocking yoke and endplates for permanent magnet rotor. 4,639,627, Cl. 310-156.000.
Takemura, Tohru; Nakashima, Atushi; Yoshida, Haruhiko; Kamo, Jun; and Hamada, Eiichi, to Mitsubishi Rayon Co., Ltd. Blood oxygenator using a hollow-fiber membrane. 4,639,353, Cl. 422-46.000.
Takeuchi, Seiji, to Kabushiki Kaisha Toshiba. Carrier reproducing circuit for phase shift keying signals. 4,639,682, Cl. 329-50.000.
Takizawa, Shozo: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.
Tallant, James C., II; and Parker, Robert P., to RCA Corporation. Non-saturating video output amplifier. 4,639,785, Cl. 358-184.000.
Talon, Inc.: *See*—
Sen Gupta, Sisir K., 4,638,557, Cl. 29-766.000.
Tamaoki, Naohiro: *See*—
Sugitani, Yuji; and Tamaoki, Naohiro, 4,639,573, Cl. 219-124.220.
Tamer, Gregory G.; and Hollinden, David E., to RCA Corporation. Television sound signal processor. 4,639,786, Cl. 358-197.000.
Tamm, Hans-Friedrich: *See*—
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.

Tamura, Fujio, to Seiko Instruments & Electronics Ltd. Quartz barometer. 4,638,664, Cl. 73-384.000.
Tamura, Hidemasa: *See*—
Yamaguchi, Takashi; Nagasawa, Naomi; and Tamura, Hidemasa. 4,639,400, Cl. 428-694.000.
Tamura, Hideo: *See*—
Kurihara, Haruki; Sagara, Minoru; Matumoto, Kenji; and Tamura, Hideo, 4,639,925, Cl. 372-46.000.
Tamura, Toru; Shibata, Noriyoshi; and Kawakami, Toshiro, to Aisin Seiki Kabushiki Kaisha. Thrust bearing for turbocharger. 4,639,148, Cl. 384-420.000.
Tanabe, Yoshio: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.
Tanaka, Hideo: *See*—
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihzra, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.
Tanaka, Hirohisa, to Nippon Seiko Kabushiki Kaisha. Control device of an infinitely variable transmission. 4,638,691, Cl. 74-866.000.
Tanaka, Kazuhiro; Yamamoto, Yasuo; Hanaoka, Katsumi; and Hirai, Masatake, to Allied Corporation. Transformer with toroidal magnetic core. 4,639,707, Cl. 336-185.000.
Tanaka, Kazumoto; Mashimo, Tohru; Sato, Osamu; and Kobayashi, Toyohiko, to Mazda Motor Corporation. Control method for drilling apparatus which makes use of a final drilling pattern transformed from primary and secondary patterns. 4,639,868, Cl. 364-420.000.
Tanaka, Kazuto; Kakizawa, Haruo; and Nagata, Kouichi, to Fuji Photo Optical Co., Ltd. Optical instrument. 4,639,099, Cl. 350-538.000.
Tanaka, Kojiro: *See*—
Namiki, Masayuki; Kamiya, Masaaki; Kojima, Yoshikazu; and Tanaka, Kojiro, 4,639,755, Cl. 357-28.000.
Tanaka, Osamu: *See*—
Hirosaki, Botaro; and Tanaka, Osamu, 4,639,939, Cl. 375-118.000.
Tanaka, Shinichi: *See*—
Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, 4,639,814, Cl. 360-130.100.
Tanaka, Shinsaku; and Yoshimura, Toshio, to Tanashin Denki Co., Ltd. Tape recorder. 4,639,800, Cl. 360-90.000.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,639,014, Cl. 280-707.000.
Tanaka, Tadashi: *See*—
Kurokawa, Kazuo; and Tanaka, Tadashi, 4,639,854, Cl. 364-157.000.
Tanaka, Teruo: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, 4,639,441, Cl. 514-195.000.
Tanaka, Toshio: *See*—
Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, 4,638,845, Cl. 164-12.000.
Tanaka, Tsunefumi: *See*—
Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,639,096, Cl. 350-427.000.
Tanaka, Yasuhito: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.
Tanashin Denki Co., Ltd.: *See*—
Tanaka, Shinsaku; and Yoshimura, Toshio, 4,639,800, Cl. 360-90.000.
Tandberg Data A/S: *See*—
Solhjell, Erik, 4,639,796, Cl. 360-77.000.
Tandem Computers Incorporated: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.
Tandler, Peter: *See*—
Schopper, Bernd; and Tandler, Peter, 4,639,048, Cl. 303-22.00R.
Tang, Chung L.; and Donaldson, William F., to Cornell Research Foundation, Inc. Optical parametric oscillator using urea crystal. 4,639,923, Cl. 372-21.000.
Tani, Toshiro: *See*—
Makishima, Akio; and Tani, Toshiro, 4,639,329, Cl. 252-501.100.
Taniguchi, Koki; Yamaguchi, Shigeri; and Nakayama, Keiji, to Sharp Kabushiki Kaisha. Circuit board connection. 4,639,062, Cl. 339-59.00M.
Taniguchi, Nobuyuki: *See*—
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,639,112, Cl. 354-455.000.
Taniguchi, Shunro: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Taniguchi, Yasutaka: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.
Tanino, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Signal transmission apparatus. 4,639,912, Cl. 370-86.000.
Tannenlaufer, Gerd, to Ford Motor Company. Adjusting mechanism for a Bowden cable. 4,638,679, Cl. 74-501.00R.
Tanner, Harley L., III; and Allen, Joseph C., to Texaco Inc. Petroleum reservoir flooding method. 4,639,596, Cl. 250-259.000.
Tatemoto, Minoru: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.
Taube, Thomas: *See*—
Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, 4,639,928, Cl. 373-93.000.
Taubner, Fred R.; and Roy, Joseph A., to GTE Products Corporation. Arc discharge lamp having improved lumen maintenance. 4,639,637, Cl. 313-489.000.
Tauzia, Jean-Michel: *See*—
Lelu, Andre E.; Grignon, Jean R.; Gonthier, Bruno F.; and Tauzia, Jean-Michel, 4,638,735, Cl. 102-290.000.
Tayco Developments, Inc.: *See*—
Taylor, Douglas P.; and Lee, David A., 4,638,895, Cl. 188-280.000.
Taylor, David H., to Thermo King Corporation. Transport refrigeration unit with evaporator fan drive using ram air pressure. 4,638,641, Cl. 62-180.000.
Taylor, David W. Classifier for comminution of pulverulent material by fluid energy. 4,638,953, Cl. 241-39.000.
Taylor, Douglas P.; and Lee, David A., to Tayco Developments, Inc. Frictionless hydraulic damper and damper-snubber. 4,638,895, Cl. 188-280.000.
Taylor, John S.: *See*—
Chadwick, Curt H.; Shulenberger, Art M.; Taylor, John S.; and Simmons, Richard R., 4,639,587, Cl. 250-201.000.
Taylor, Lawrence H. Metallic structural member particularly for support of walls and floors of buildings. 4,638,615, Cl. 52-364.000.
TDK Corporation: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; and Arioka, Hiroyuki, 4,639,389, Cl. 428-141.000.
Tecumseh Products Company: *See*—
Gannaway, Edwin L., 4,639,198, Cl. 417-410.000.
Teijin Limited: *See*—
Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, 4,638,624, Cl. 57-208.000.
Yatabe, Toshiaki; Nishihara, Toshio; and Suzuki, Nobuo, 4,639,069, Cl. 350-1.700.
Telefonaktiebolaget LM Ericsson: *See*—
Jarnestedt, Goran; and von Campenhausen, Rolf, 4,639,935, Cl. 375-11.000.
Karlsson, Goran R.; and Karnevi, John H. S., 4,639,731, Cl. 342-147.000.
Telefunken Electronic GmbH: *See*—
Beckenbach, Walter; and Rinderle, Heinz, 4,639,686, Cl. 330-307.000.
Telefunken Fernseh und Rundfunk GmbH: *See*—
Scholz, Werner, 4,639,687, Cl. 331-1.00A.
Terada, Yumiko: *See*—
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,639,088, Cl. 350-339.00F.
Terao, Naoyosi: *See*—
Aoyama, Tsutomu; Nakamura, Taizo; Terao, Naoyosi; and Shinonaga, Hirohiko, 4,639,098, Cl. 350-514.000.
Teske, Artur; and Klimmeck, Dietrich A. Apparatus for the inspection of combined read/write heads of data carrier disks in EDP installations. 4,639,097, Cl. 350-507.000.
Tesoriere, Jean-Marc: *See*—
Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, 4,639,929, Cl. 373-120.000.
Tetra Pak International Aktiebolag: *See*—
Kimura, Yoshio, 4,638,903, Cl. 198-419.000.
Teuscher, Leon A.: *See*—
Mishra, Satchidanand; and Teuscher, Leon A., 4,639,402, Cl. 430-58.000.
Texaco Inc.: *See*—
Bousaid, Issam S., 4,638,864, Cl. 166-251.000.
Cook, Ronald L., 4,639,296, Cl. 204-59.00R.
Quock, Deborah E. R.; Triplett, Timothy L.; and Childress, Don E., 4,639,312, Cl. 210-101.000.
Savage, Kerry D., 4,638,862, Cl. 166-248.000.
Tanner, Harley L., III; and Allen, Joseph C., 4,639,596, Cl. 250-259.000.
Texas Instruments Incorporated: *See*—
Boulanger, Henry J., 4,638,721, Cl. 92-6.00D.
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.
D'Hont, Lodewijk J., 4,639,765, Cl. 358-19.000.
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.
Thepault, Claude, to Crouzet S.p.A. Connection device for electrical component. 4,639,059, Cl. 339-17.00F.
Theret, Jean-Mare C. F.: *See*—
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., 4,639,280, Cl. 148-404.000.
Therkorn, Jens. Couch of adjustable inclination for body extension. 4,638,793, Cl. 128-71.000.

Thermo Electron Corporation: *See*—
Pezaris, Stylianos, 4,639,874, Cl. 364-478.000.
Thermo King Corporation: *See*—
Taylor, David H., 4,638,641, Cl. 62-180.000.
Thiel, Reinhard A., administrator: *See*—
Enders, Max L., deceased; and Thiel, Reinhard A., administrator, 4,639,044, Cl. 301-9.0DN.
Thirion de Briel, Jacques; and Jaccod, Michel, to Valeo. Speed change device pulley with a seal around the hub. 4,639,239, Cl. 474-8.000.
Thomas Engineering, Inc.: *See*—
Casey, Thomas J., 4,639,383, Cl. 427-213.000.
Thomas, Mammen: *See*—
Price, William L.; Schlupp, Ronald L.; and Thomas, Mammen, 4,639,288, Cl. 156-643.000.
Thompson, Douglas, to Boeing Company, The. Hole angularity gauge. 4,638,566, Cl. 33-534.000.
Thomson-CSF: *See*—
Daubresse, Francis, 4,639,835, Cl. 361-392.000.
Hoet, Roger; and Gerlach, Pierre, 4,639,633, Cl. 313-35.000.
Huignard, Jean-Pierre; Malard, Marcel; and de Corlieu, Guy, 4,639,091, Cl. 350-347.00V.
Kaire, Jean C., 4,639,551, Cl. 323-231.000.
Thorn EMI Domestic Appliances Limited: *See*—
Brooks, Steve M.; and May, David R., 4,639,579, Cl. 219-464.000.
Thornley, Richard, to Storage Technology Corporation. Asymmetrical shields for controlling feedthrough in read/write heads. 4,639,808, Cl. 360-121.000.
Thrane, David T.: *See*—
Turpin, Edward T.; and Thrane, David T., 4,639,299, Cl. 204-181.700.
Ticks, Gerd-Heinz: *See*—
Idigkeit, Werner; Kurr, Klaus; and Ticks, Gerd-Heinz, 4,638,983, Cl. 267-140.100.
Tittel, Hans: *See*—
Bensussen, Isaac M.; and Tittel, Hans, 4,638,692, Cl. 81-9.410.
Tluchor, Denek: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,639,570, Cl. 219-121.0PP.
Tobia, Alfonso J.: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., 4,639,518, Cl. 544-285.000.
Toda, Masumi; Ozaki, Yukio; and Nonaka, Shingo, to Shinagawa Refractories Co., Ltd. Nozzle for the gunning of monolithic refractories. 4,638,945, Cl. 239-143.000.
Todd, Mike J., to Multi-Clean, Inc. Air guard diffuser. 4,638,523, Cl. 15-98.000.
Toegel, Herbert J.; Yudichak, Joseph R.; and Gilsdorf, John F., to ITT Corporation. Apparatus for establishing communication paths. 4,639,910, Cl. 370-58.000.
Togashi, Toshio, to Kawasaki Jukogyo Kabushiki Kaisha. Side stand of a motorcycle. 4,638,880, Cl. 180-219.000.
Togneri, Mauro G. Graphic display. 4,639,724, Cl. 340-815.010.
Toko, Inc.: *See*—
Murata, Kiyobumi, 4,639,696, Cl. 333-138.000.
Tokuda, Kanji: *See*—
Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, 4,639,118, Cl. 355-29.000.
Tokuno, Sanji, to Kyowa Hakko Kogyo Co., Ltd. Heat pump. 4,638,642, Cl. 62-498.000.
Tokyo Electric Co., Ltd.: *See*—
Sakura, Yasuhiro, 4,639,287, Cl. 156-361.000.
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Ueki, Takashi; and Ishikawa, Yoshihiro, 4,638,789, Cl. 126-351.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Iizuka, Tetsuya, 4,639,758, Cl. 357-42.000.
Iwahashi, Hiroshi; and Ochii, Kiyofumi, 4,639,895, Cl. 365-200.000.
Tolbert, William R.: *See*—
Geimer, Raymond C.; and Tolbert, William R., 4,639,422, Cl. 435-286.000.
Tomase, Joseph P.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.
Tomasovic, Beth A.; and Novack, Robert L., to Bacharach, Inc. Electrochemical gas sensor. 4,639,306, Cl. 204-432.000.
Tomaszewski, Walter: *See*—
Yang, James H. C.; and Tomaszewski, Walter, 4,638,532, Cl. 24-462.000.
Tomida, Yasutaka: *See*—
Yamamoto, Takemi; and Tomida, Yasutaka, 4,639,152, Cl. 400-120.000.
Tomita, Yasuo, to Canon Kabushiki Kaisha. Magneto-optical recording medium. 4,639,816, Cl. 360-131.000.
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Tomozawa, Kikuo: *See*—
Otobe, Yutaka; Kiuchi, Takeo; and Tomozawa, Kikuo, 4,639,870, Cl. 364-431.050.
Ton Company Ltd.: *See*—
Matsunobu, Akira; Horishita, Sumio; and Yamada, Tetsuo, 4,639,374, Cl. 426-43.000.
Tong Lung Metal Industry Co., Ltd.: *See*—
Fann, Yaw S.; and Wu, Rong-Fan, 4,639,025, Cl. 292-337.000.
Tonsmann, Armin, to Schuco Heinz Schurmann GmbH & Co. Metal-glass structure for a front wall or a roof. 4,638,613, Cl. 52-235.000.
Topfl, Werner, to Ciga-Geigy Corporation. Herbicidal N-arylsulfonyl-N'-(4-mercaptomethylpyrimdinyl)-ureas. 4,639,264, Cl. 71-87.000.
Toray Industries, Inc.: *See*—
Sato, Yoshiaki; and Suzuki, Hisao, 4,639,397, Cl. 428-397.000.
Tornare, Jean; Bofinger, Klaus; and Tschopp, Claudio. Pump for cryogenic fluids. 4,639,197, Cl. 417-259.000.
Tornay, Edmund G. Vessel hull and bulkheads construction employing curved plating. 4,638,754, Cl. 114-79.00R.
Torrence, Robert J., to Eaton Corporation. Inline solenoid operated slide valve. 4,638,973, Cl. 251-129.020.
Total Compagnie Francaise des Petroles: *See*—
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel J.; and Kaluszynski, Michel, 4,638,984, Cl. 269-43.000.
Totsuka, Motoyuki: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.
Tournere, Marcel J.: *See*—
Debeneix, Pierre; and Tournere, Marcel J., 4,638,631, Cl. 60-226.300.
Touyer, Gaetan: *See*—
Jouquey, Alain; Salmon, Jean; Mouren, Michel; and Touyer, Gaetan, 4,639,336, Cl. 260-397.500.
Toyo Ink Mfg., Co., Ltd.: *See*—
Ito, Masashi; Ohashi, Toshio; and Ui, Katsumi, 4,639,272, Cl. 106-243.000.
Toyo Rubber Industry Co., Ltd., The: *See*—
Umemoto, Sumio; Hattori, Eiichi; and Kamakari, Ryutaro, 4,639,384, Cl. 427-290.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Misaki, Akira; Sone, Yoshiaki; and Kato, Takao, 4,639,516, Cl. 536-123.000.
Sakanaka, Yasuhiro; and Okuzono, Shuichi, 4,639,508, Cl. 528-486.000.
Toyoda Goseki Co., Ltd.: *See*—
Sugita, Hiroshi; Iwasa, Tadanobu; Yasukawa, Takemasa; and Aritake, Masanori, 4,638,525, Cl. 15-250.360.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ikeda, Shinji, 4,638,784, Cl. 123-571.000.
Iyoda, Motomi, 4,639,831, Cl. 361-286.000.
Shiki, Kazuhiro; and Iura, Takao, 4,638,781, Cl. 123-493.000.
Toyoto Jidosha Kabushiki Kaisha: *See*—
Ito, Masashi; Ohashi, Toshio; and Ui, Katsumi, 4,639,272, Cl. 106-243.000.
Traber, Rene P.: *See*—
Wenger, Roland; Traber, Rene P.; Kobel, Hans; and Hofmann, Hans, 4,639,434, Cl. 514-11.000.
Trammell, Lyndale A.: *See*—
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.
Traweek, Marvin B., IV: *See*—
Magee, Robert L., Jr.; and Traweek, Marvin B., IV, 4,638,860, Cl. 166-114.000.
Tresper, Erhard: *See*—
Alewelt, Wolfgang; Eisermann, Wolfgang; Meyer, Karl-Heinrich; Tresper, Erhard; and Ullrich, Martin, 4,639,507, Cl. 528-388.000.
Treybig, James G.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.
Trinh, Lahn T.; and Lewis, Thomas E., to Ailied Corporation. Individual cylinder ignition control. 4,638,780, Cl. 123-416.000.
Triplett, Timothy L.: *See*—
Quock, Deborah E. R.; Triplett, Timothy L.; and Childress, Don E., 4,639,312, Cl. 210-101.000.
Trokel, Stephen L.: *See*—
Daly, Richard T.; and Trokel, Stephen L., 4,638,801, Cl. 128-303.100.
Tronc, Dominique, to C. G. R. MeV. Self-focusing linear charged particle accelerator structure. 4,639,641, Cl. 315-5.410.
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., to Omnichem S.A. Vinblastin-23-oyl amino acid derivatives. 4,639,456, Cl. 514-283.000.
Truckenbrodt, Randall, to Randall Industries. Repositionable thermal insulating truck bulkhead. 4,639,031, Cl. 296-24.00R.
TRW Ehrenreich GmbH & Co. KG: *See*—
Amrath, Hans, 4,639,159, Cl. 403-50.000.
TRW Inc.: *See*—
Lindeman, Richard J.; and Rachwalski, Thaddeus M., 4,639,056, Cl. 339-17.0LC.
Tryan, Fredrick W.: *See*—
Whetstone, Wayne L.; and Tryan, Fredrick W., 4,638,640, Cl. 62-139.000.
Tsai, Chee-Hway, to Procter & Gamble Company, The. Enzymatic treatment of black tea leaf. 4,639,375, Cl. 426-49.000.
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Yang, Yan Y.; and Tsair, Chu H., 4,638,517, Cl. 5-236.00R.
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Tornare, Jean; Bofinger, Klaus; and Tschopp, Claudio, 4,639,197, Cl. 417-259.000.
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Maruyama, Asao; and Miyagawa, Kohzo, 4,639,187, Cl. 414-787.000.
Tsubouchi, Yuzo, 4,639,181, Cl. 414-349.000.
Tsuboi, Nobuyuki. Precision roller attachment for automation procession. 4,638,741, Cl. 105-141.000.
Tsubouchi, Yuzo, to Tsubakimoto Chain Co. Pallet exchange device. 4,639,181, Cl. 414-349.000.
Tsuda, Keishiro: *See*—
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.
Tsukada, Keizo: *See*—
Yamagawa, Masato; and Tsukada, Keizo, 4,639,550, Cl. 379-62.000.
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Aoki, Yoshio; and Tsukamura, Yoshihiro, 4,639,907, Cl. 369-45.000.
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Moribe, Yoshihiro; Hayashi, Yukitaka; Maekawa, Hideo; and Tsukui, Kunitsugu, 4,639,804, Cl. 360-105.000.
Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Drive system for a semiconductor laser. 4,639,924, Cl. 372-33.000.
Tsunoda, Kazuyuki: *See*—
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.
Tsunoda, Kouichi: *See*—
Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, 4,638,538, Cl. 29-149.50C.
Tsunokawa, Shinya: *See*—
Iuchi, Akira; and Tsunokawa, Shinya, 4,638,975, Cl. 251-149.600.
Tsuruta, Hisato: *See*—
Ejiri, Yuuki; Ito, Tomoo; Tsuruta, Hisato; and Kamifuji, Hiroshi, 4,639,624, Cl. 310-154.000.
Tsuruta, Masahiko: *See*—
Hirota, Akira; and Tsuruta, Masahiko, 4,639,805, Cl. 360-108.000.
Tsuruzoe, Nobutomo: *See*—
Fujikawa, Yoshihiro; Sakashita, Mitsuaki; and Tsuruzoe, Nobutomo, 4,639,444, Cl. 514-222.000.
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Kondo, Akihiro; Tsushima, Rikio; and Sumida, Yuzo, 4,639,491, Cl. 524-801.000.
Tsutsumi, Teruo, to Kabushiki Kaisha Toshiba. Thermal transfer recording method and apparatus. 4,639,739, Cl. 346-76.0PH.
Turnbull, William T.: *See*—
Smith, Glenn C.; Needham, James R.; and Turnbull, William T., 4,639,176, Cl. 411-468.000.
Turner, Paul F., to BSD Medical Corporation. Electric field probe. 4,638,813, Cl. 128-804.000.
Turpin, Edward T.; and Thrane, David T., to SCM Corporation. Acrylic and acrylic/epoxy copolymer composition as self-curing cathodic electrocoating vehicles. 4,639,299, Cl. 204-181.700.
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, to Neste Oy. Cyclic process for producing an alkali solution of cellulose carbamate and precipitating the carbamate. 4,639,514, Cl. 536-30.000.
Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, to Neste Oy. Cyclic process for producing an alkali solution of cellulose carbamate and precipitating the carbamate. 4,639,515, Cl. 536-30.000.
Tyer, Robert R. Fine bubble diffuser and diffuser system having filtered blow-down tube. 4,639,314, Cl. 210-220.000.
Tyson, William H. Grill means. 4,638,787, Cl. 126-25.00R.
Uchikata, Yoshio; Nozaki, Mineo; Asakura, Osamu; and Nagashima, Masasumi, to Canon Kabushiki Kaisha. Recording apparatus. 4,639,744, Cl. 346-76.0PH.
Uckermann, Bernd: *See*—
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.
Uedaira, Satoru: *See*—
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.
Ueki, Takashi; and Ishikawa, Yoshihiro, to Rinnai Kabushiki Kaisha; and Tokyo Gas Kabushiki Kaisha. Safety apparatus for combustion device. 4,638,789, Cl. 126-351.000.
Ueno, Atsushi; and Abumi, Takao, to Sharp Kabushiki Kaisha. Video signal superimposing device. 4,639,768, Cl. 358-22.000.
Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, to Brother Kogyo Kabushiki Kaisha. Electronic typewriter which prints selected portions of a text. 4,639,151, Cl. 400-63.000.
Ueno, Katsuji; Nagaoka, Kenji; Miyashita, Akira; and Ebisu, Satoshi, to Sumitomo Chemical Company, Limited. Process for producing formed articles of aromatic polyamide-imide resin. 4,639,344, Cl. 264-83.000.
Ueno, Michio; Miyagi, Toshimi; and Yamaguchi, Soji, to Murata Manufacturing Co., Ltd. Fly-back transformer with reduced ringing. 4,639,663, Cl. 323-356.000.
Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, to Matsushita Electric Industrial Co., Ltd. Tape recorder with improved tape cassette pad shifter. 4,639,814, Cl. 360-130.100.
Ueno, Susumu: *See*—
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.
Ui, Katsumi: *See*—
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Ullrich, Martin: *See*—
Alewelt, Wolfgang; Eisermann, Wolfgang; Meyer, Karl-Heinrich; Tresper, Erhard; and Ullrich, Martin, 4,639,507, Cl. 528-388.000.
Umeki, Tsunenori: *See*—
Mizugaki, Shigeo; and Umeki, Tsunenori, 4,639,892, Cl. 365-182.000.
Umemoto, Hiroshi: *See*—
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Umemoto, Sumio; Hattori, Eiichi; and Kamakari, Ryutaro, to Toyo Rubber Industry Co., Ltd., The. Method of casting urethane elastomer on metal. 4,639,384, Cl. 427-290.000.
Umemura, Hiroo, to Taiho Kogyo Corporation, Ltd. Method and apparatus for measuring wall thickness of a workpiece. 4,638,568, Cl. 33-549.000.
Umetani, Katsutoshi: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.
Umlauf, Norbert: *See*—
Oberlander, Karol H.; and Umlauf, Norbert, 4,638,701, Cl. 83-490.000.
Union Carbide Corporation: *See*—
Crowley, Harris L., Jr., 4,639,836, Cl. 361-433.000.
Fellows, Constance A.; and Fu, Wallace Y., 4,639,536, Cl. 549-462.000.
Union Oil Company of California: *See*—
Moorehead, Eric L., 4,639,530, Cl. 549-260.000.
United Coal Company: *See*—
Smith, Lloyd B., 4,639,320, Cl. 210-739.000.
United Kingdom Atomic Energy Authority: *See*—
Keats, Albert B., 4,639,882, Cl. 364-550.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in her Britannic Majesty's Government of the: *See*—
McCanny, John V.; and McWhirter, John G., 4,639,857, Cl. 364-200.000.
United States Gypsum Company: *See*—
Wendt, Alan C., 4,638,606, Cl. 52-36.000.
United States of America
Air Force: *See*—
Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., 4,639,586, Cl. 250-201.000.
Hopwood, Francis W.; Caldwell, Stephen P.; and Decker, Martin J., 4,639,688, Cl. 331-10.000.
Salour, Michael M.; and Fehrenbach, Gustav W., 4,639,075, Cl. 350-96.160.
Army: *See*—
Mariani, Elio A.; and Skudera, William J., Jr., 4,639,695, Cl. 333-133.000.
McIngvale, Pat H., 4,638,737, Cl. 102-489.000.
Pistor, Helmut H., 4,639,603, Cl. 250-504.00R.
Roberts, Thomas G.; and Honeycutt, Thomas E., 4,639,642, Cl. 315-39.000.
Sayles, David C., 4,638,739, Cl. 102-520.000.
Vig, John R., 4,638,536, Cl. 29-25.350.
Energy: *See*—
Farmwald, Paul M., 4,639,887, Cl. 364-748.000.
Jackovitz, John F.; and Kunkle, Richard P., 4,639,401, Cl. 429-30.000.
Lewandowski, Edward F.; Cassidy, Dale A.; and Sommer, Robert G., 4,639,571, Cl. 219-121.0EC.
Navy: *See*—
Aprigliano, Louis F., 4,639,399, Cl. 428-623.000.
Hinton, George F., 4,639,675, Cl. 324-334.000.
Leverance, Robert A.; and Longas, Socrates A., 4,639,902, Cl. 367-93.000.
U.S. Philips Corporation: *See*—
Bakker, Gijsbertus; and Rorije, Gerhardus J., 4,639,636, Cl. 313-408.000.
Beaumont, Chritien J. M., 4,639,672, Cl. 324-318.000.
Boutterin, Daniel; Bertaux, Jean-Paul; and Bader, Alain, 4,639,916, Cl. 371-16.000.
Giakoumis, Alex, 4,639,617, Cl. 307-296.00R.
Goldmann, Peter, 4,639,793, Cl. 360-44.000.
Gustafson, Bengt G., 4,639,900, Cl. 367-5.000.
Hazan, Jean-Pierre; and Steers, Michel, 4,639,137, Cl. 356-339.000.
Hoppmanns, Rolf D.; Steup, Walter; Wieczorek, Willibald; and Beitler, Franz, 4,639,801, Cl. 360-96.500.
Kasperkovitz, Wolfdietrich G.; and Van Rumpt, Herman W., 4,639,679, Cl. 328-20.000.
Loy, Fernand R., 4,639,082, Cl. 350-172.000.
Maan, Nicolaus, 4,639,131, Cl. 356-73.100.
Metcalfe, John G., 4,639,703, Cl. 335-213.000.
Morton, Stephen F. N., 4,639,136, Cl. 356-312.000.

Ponjee, Johannes J.; and Verwijlen, Christiaan J. A., 4,639,382, Cl. 427-162.000.
Roza, Engel; and Van Veenendaal, Hendrik G., 4,639,911, Cl. 370-69.100.
Wagenmakers, Johannes, 4,639,620, Cl. 307-446.000.
Zijlstra, Hinne, 4,639,673, Cl. 324-319.000.

United Technologies Automotive, Inc.: *See*—
Floyd, William M.; and Juzswik, David L., 4,639,609, Cl. 307-10.00R.

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Kubick, Frederick, 4,639,093, Cl. 350-388.000.
Spock, Wayne R.; and Meisner, Richard P., 4,639,885, Cl. 364-574.000.
Stetson, Karl A.; and Palecki, John, 4,639,593, Cl. 250-227.000.

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Dufrenne, Gerald, 4,639,569, Cl. 219-109.000.

University of Illinois, The Board of Trustees of The: *See*—
Holonyak, Nick, Jr., 4,639,275, Cl. 148-1.500.

Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, to Kabushiki Kaisha Takuma; and Nihon Jukagaku Kogyo Kabushiki Kaisha. Continuous melt electric furnace with continuous discharge. 4,639,927, Cl. 373-84.000.

Uno, Masatoshi, to Kabushiki Kaisha Nagaoka. Cleaning disket with internal paths for cleaning liquid. 4,639,813, Cl. 360-128.000.

UOP Limited: *See*—
Holt, Andrew; Cheek, Martin G.; and Clegg, Ernest N., 4,639,432, Cl. 502-324.000.

Upchurch, James E., to Woods Wire Products, Inc. Trouble light with rotatable attaching means. 4,639,842, Cl. 362-376.000.

Urabe, Tetsuo; and Kojima, Shigeru, to Sony Corporation. Liquid crystal display apparatus. 4,639,722, Cl. 340-784.000.

Uriuhara, Makoto: *See*—
Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,638,690, Cl. 74-866.000.

Urwyler, Peter R., to Simtek Inc. Apparatus for dispensing strip material or the like. 4,638,696, Cl. 83-261.000.

Ushiyama, Shigeyuki: *See*—
Takekoshi, Yoshitaka; and Ushiyama, Shigeyuki, 4,639,627, Cl. 310-156.000.

USM Corporation: *See*—
Schuster, Heinz; and Press, Gerd, 4,639,155, Cl. 401-1.000.

Uytterhoeven, Herman: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.

Uytterhoeven, Herman J.; De Winter, Walter F.; and Marien, August M., to Agfa-Gevaert, N.V. Liquid developer for development of electrostatic images. 4,639,404, Cl. 430-115.000.

Val, Christian; Pinel, Joseph; and Gibod, Yves B., to Compagnie d'Informatique Militaire, Spatiale et Aeronautique. Radiation-hardened casing for an electronic component. 4,639,826, Cl. 361-272.000.

Valenty, Vivian B.; Hill, William H.; and Ravi, Prasad S., to A. E. Staley Manufacturing Company. Detergent builder. 4,639,325, Cl. 252-89.100.

Valeo: *See*—
Bouvot, Jean-Francois; and Leborgne, Jose , 4,638,723, Cl. 92-48.000.
Jaccod, Michel, 4,639,238, Cl. 474-8.000.
Thirion de Briel, Jacques; and Jaccod, Michel, 4,639,239, Cl. 474-8.000.

Valyocsik, Ernest W., to Mobil Oil Corporation. Synthesis of crystalline silicate ZSM-5 using an organic sulfonic acid. 4,639,360, Cl. 423-329.000.

Vamatex S.p.A.: *See*—
Pezzoli, Nello, 4,638,839, Cl. 139-449.000.

VanAken, Jerry R.: *See*—
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.

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Van Dorsser, William R.: *See*—
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Van Rumpt, Herman W.: *See*—
Kasperkovitz, Wolfdietrich G.; and Van Rumpt, Herman W., 4,639,679, Cl. 328-20.000.

Van Slyke, Allan S.: *See*—
Sovacool, David K.; Van Slyke, Allan S.; and Bungo, Edward M., 4,638,964, Cl. 248-56.000.

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Roza, Engel; and Van Veenendaal, Hendrik G., 4,639,911, Cl. 370-69.100.

Varbanov, Hristo P.: *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.

Vaughn, Charles R. Guy-wire guard assembly and fastening systems therefor. 4,638,611, Cl. 52-147.000.

VDO Adolf Schindling AG: *See*—
Collonia, Harald, 4,638,879, Cl. 180-179.000.

Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Foerster, Karl-Heinz; and Koerner, Siegfried, 4,639,776, Cl. 358-107.000.

VEB Kombinat Textima: *See*—
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Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.

Veith, Ronald D.: *See*—
Persson, Eric G.; and Veith, Ronald D., 4,639,845, Cl. 363-26.000.

Velev, Alexander S.: *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.

Venus Scientific Inc.: *See*—
Gallios, George C.; and Lien, Charles, 4,639,844, Cl. 363-17.000.

Vepa Aktiengesellschaft: *See*—
Fleissner, Heinz, 4,638,572, Cl. 34-41.000.

Vermilion, Everette E.: *See*—
Paterson, Noel S.; and Vermilion, Everette E., 4,639,730, Cl. 340-970.000.

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Ponjee, Johannes J.; and Verwijlen, Christiaan J. A., 4,639,382, Cl. 427-162.000.

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Milne, Alistair R.; and Davison, Grenville, 4,638,713, Cl. 89-14.100.

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Rung, Robert; and Ache, Lani G., 4,639,020, Cl. 285-367.000.

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Fujita, Akira; and Shimizu, Kyoichi, 4,639,782, Cl. 358-166.000.
Goto, Kunio, 4,639,906, Cl. 369-14.000.
Hirota, Akira; and Tsuruta, Masahiko, 4,639,805, Cl. 360-108.000.
Inoue, Osamu, 4,639,799, Cl. 360-85.000.
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,638,710, Cl. 84-1.260.
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; and Kuroda, Akio, 4,639,908, Cl. 369-288.000.
Sakai, Kunihide, 4,639,810, Cl. 360-125.000.

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Archer, David H.; Bauer, Frank I.; and Vidt, Edward J., 4,638,629, Cl. 60-39.050.

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Hager, Juergen; Vieth, Walter; and Manderla, Werner, 4,638,697, Cl. 83-356.300.

Vig, John R., to United States of America, Army. Method of making a resonator having a desired frequency from a quartz crystal resonator plate. 4,638,536, Cl. 29-25.350.

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Kim, Myung K.; and Viriyayuthakorn, Montri, 4,638,762, Cl. 118-725.000.

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Prince, Alfred M.; and Vnek, John, 4,639,371, Cl. 424-86.000.

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Buchner, Norbert; Lemke, Kuno; and Vogele, Gunter, 4,638,925, Cl. 222-21.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Leineweber, Gunter; Warnecke, Rolf; and Ruhmer, Heinz, 4,638,719, Cl. 91-373.000.

von Ballmoos, Roland: *See*—
Derouane, Eric G.; and von Ballmoos, Roland, 4,639,357, Cl. 423-306.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,639,358, Cl. 423-306.000.

von Campenhausen, Rolf: *See*—
Jarnestedt, Goran; and von Campenhausen, Rolf, 4,639,935, Cl. 375-11.000.

von Gizycki, Ulrich: *See*—
Muller, Hanns P.; Clarenz, Werner; von Gizycki, Ulrich; and Wagner, Kuno, 4,639,502, Cl. 528-45.000.

Vonhausen, Georg, to General Motors Corporation. Valve actuator. 4,638,977, Cl. 251-248.000.

Von Kohorn, Henry; and Kydonieus, Agis F., to Herculite Protective Fabrics Corporation. Dispensers for the controlled release of pest-controlling agents and methods for combatting pests therewith. 4,639,393, Cl. 428-304.400.

Vorlop, Claus: *See*—
Kahlert, Wolfgang; Klein, Joachim; Steinert, Hans-Jurgen; and Vorlop, Claus, 4,639,423, Cl. 435-287.000.

Voss, Steven H.: *See*—
Neubauer, Jerry L.; Schmidt, Laurence J.; and Voss, Steven H., 4,639,802, Cl. 360-98.000.

Vrzalik, John H., to Kinetic Concepts, Inc. Therapeutic bed support. 4,638,516, Cl. 5-64.000.

VSI Corporation: *See*—
Whitehorn, Sydney H., 4,638,849, Cl. 164-311.000.

Vyas, Dolatrai M.: *See*—
Kaplan, Murray A.; and Vyas, Dolatrai M., 4,639,528, Cl. 548-422.000.

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Gunther, Walter, 4,639,563, Cl. 200-61.45M.

W. R. Grace & Co.: *See*—
Kreh, Robert P.; and Spotnitz, Robert M., 4,639,298, Cl. 204-59.00R.

W. R. Grace & Co., Cryovac Div.: *See*—
Howe, Milton A., Jr., 4,638,913, Cl. 206-632.000.

W. Schlafhorst & Co.: *See*—
Wey, Edmund, 4,638,956, Cl. 242-35.50A.

Wacyk, Ihor T., to RCA Corporation. Priority encoded spare element decoder. 4,639,897, Cl. 365-200.000.

Wada, Hidekazu: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Wada, Hidekazu, 4,639,699, Cl. 333-202.000.

Wada, Hideo; and Goto, Humio, to Hitachi, Ltd. Computer system. 4,639,862, Cl. 364-200.000.

Wada, Kenichi: *See*—
Hashimoto, Masahiro; Watanabe, Tsuyoshi; and Wada, Kenichi, 4,639,886, Cl. 364-736.000.

Wada, Takaaki: *See*—
Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, 4,638,618, Cl. 52-509.000.

Wade, James J.: *See*—
McQuinn, Roy L.; and Wade, James J., 4,639,445, Cl. 514-222.000.

Wafer Scale Integration, Inc.: *See*—
Eitan, Boaz, 4,639,893, Cl. 365-185.000.

Wagatsuma, Kikuji: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,638,710, Cl. 84-1.260.

Wagenhals, Fred W.: *See*—
Lawrence, Donald R., 4,639,007, Cl. 280-234.000.

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Waggoner, Marion G., to Du Pont de Nemours, E. I., and Company. Extruding process for preparing functionalized polyolefin polymers. 4,639,495, Cl. 525-285.000.

Wagner, Hans: *See*—
Hartl, Christof; and Wagner, Hans, 4,639,556, Cl. 381-68.600.

Wagner, Karl-Heinz: *See*—
Viehrig, Wolfgang; Wagner, Karl-Heinz; and Laar, Erwin, 4,638,936, Cl. 226-191.000.

Wagner, Kuno: *See*—
Muller, Hanns P.; Clarenz, Werner; von Gizycki, Ulrich; and Wagner, Kuno, 4,639,502, Cl. 528-45.000.

Wakabayashi, Tatsuro: *See*—
Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, 4,638,538, Cl. 29-149.50C.

Wald, Robert D., to Data Motion, Incorporated. Paper feed tractor with belt tensioning. 4,638,935, Cl. 226-171.000.

Walker, Roger E.: *See*—
Grunert, Kurt A.; Walker, Roger E.; Paton, Charles R.; and Leone, David A., 4,639,564, Cl. 200-144.00R.

Wallace, Kathleen M.: *See*—
Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., 4,638,865, Cl. 166-274.000.

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Waller, Leonard J. E.: *See*—
Waller, Francis E., 4,638,547, Cl. 29-558.000.
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Walling, James D.: *See*—
Ville, Ivan B.; Walling, James D.; and Yousey, Kevin E., 4,638,759, Cl. 118-657.000.

Walsh, William H., to Gillette Company, The. Method of manufacturing and delivering coil springs. 4,638,653, Cl. 72-129.000.

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Wang, Cheng-Chung. Toy having an envelope enclosing a moving mechanism. 4,639,232, Cl. 446-220.000.

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Ward, Billy W.: *See*—
Doherty, John A.; Ward, Billy W.; and Shaver, David C., 4,639,301, Cl. 204-192.310.

Warmack, Ralph E.; and Woodruff, William D., to Standard Oil Company. Method for testing cableless seismic digital field recorders. 4,639,901, Cl. 367-13.000.

Warnecke, Rolf: *See*—
Leineweber, Gunter; Warnecke, Rolf; and Ruhmer, Heinz, 4,638,719, Cl. 91-373.000.

Warner, Dale J. Automatic aligning cartridge mount seal. 4,639,000, Cl. 277-41.000.

Warren, Brian T.: *See*—
Abram, Trevor S.; Norman, Peter; and Warren, Brian T., 4,639,535, Cl. 549-419.000.

Washizuka, Isamu, to Sharp Kabushiki Kaisha. Portable audio-visual electronic apparatus. 4,639,225, Cl. 434-308.000.

Watanabe, Hideaki: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.

Watanabe, Kazuo; and Sato, Tetsuo, to Hitachi, Ltd. Signal transmission circuit. 4,639,795, Cl. 360-62.000.

Watanabe, Kunio: *See*—
Yamamoto, Mitsuru; Watanabe, Kunio; and Shimoda, Junji, 4,639,735, Cl. 346-1.100.

Watanabe, Minoru: *See*—
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.

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Watanabe, Tokumi: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,638,710, Cl. 84-1.260.

Watanabe, Tsuyoshi: *See*—
Hashimoto, Masahiro; Watanabe, Tsuyoshi; and Wada, Kenichi, 4,639,886, Cl. 364-736.000.

Waterston, John W.: *See*—
Olson, Douglas R.; Harness, James R.; and Waterston, John W., 4,639,419, Cl. 435-5.000.

Watson, David: *See*—
McHale, Charles J.; Marrone, Joseph; and Watson, David, 4,639,872, Cl. 364-463.000.

Watson, Edward P., to Western Geophysical Company of America. Tank leakage detector. 4,638,662, Cl. 73-302.000.

Watson, Keith G.: *See*—
Farquharson, Graeme J.; Watson, Keith G.; and Bird, Graham J., 4,639,267, Cl. 71-98.000.

Watson, Robert L., to Weyerhaeuser Company. Shipping and display container. 4,638,941, Cl. 229-104.000.

Wayne, Reginald: *See*—
Nichols, Walter A.; and Wayne, Reginald, 4,638,818, Cl. 131-281.000.

Weatherly, John D., to Development Finance Corporation of New Zealand. Parallelogram electric coil helically wound. 4,639,708, Cl. 336-200.000.

Weaver, Clarence M., Jr.: *See*—
Cohen, Edward; Weaver, Clarence M., Jr.; and Duschl, Robert A., 4,639,775, Cl. 358-106.000.

Webb, David B.: *See*—
Wright, David A.; and Webb, David B., 4,639,229, Cl. 441-42.000.

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Weber, Georg: *See*—
Krause, Joachim; Romer, Michael; and Weber, Georg, 4,639,328, Cl. 252-299.610.

Webster, Joseph P., to Newco Enterprises, Inc. Hot beverage container. 4,6[illegible]8, Cl. 222-155.000.

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Wegner, Christian: *See*—
Richter, Roland; Muller, Hanns P.; and Wegner, Christian, 4,638,795, Cl. 128-90.000.

Wehner, Wolfgang: *See*—
Muller, Horst; Zinke, Horst; and Wehner, Wolfgang, 4,639,482, Cl. 524-137.000.

Weil, Max H.: *See*—
Bisera, Jose; Carrington, James H.; and Weil, Max H., 4,638,811, Cl. 128-673.000.

Weiss, Manfred, to Richard Kablitz GmbH & Co. KG. Inclined grate for furnaces. 4,638,905, Cl. 198-774.000.

Welborn, Austin E. Direction and angle maintenance tool and method for adjusting and maintaining the angle of deviation of a directionally drilled borehole. 4,638,873, Cl. 175-73.000.

Wells, R. Leon: *See*—
Hart, Joseph D.; and Wells, R. Leon, 4,639,191, Cl. 415-196.000.

Wendt, Alan C., to United States Gypsum Company. Decorative trim system for partition adapted to support a cantilevered load. 4,638,606, Cl. 52-36.000.

Wendt, Paul H.: *See*—
Meyle, William H.; and Wendt, Paul H., 4,639,230, Cl. 445-30.000.

Wenger, Roland; Traber, Rene P.; Kobel, Hans; and Hofmann, Hans, to Sandoz Ltd. Novel cyclosporins. 4,639,434, Cl. 514-11.000.

Wenzel, Reinhard: *See*—
Pav, Josef; Rauf, Richard; Svenka, Peter; and Wenzel, Reinhard, 4,639,346, Cl. 264-280.000.

Wernau, William C.: *See*—
Beck, Donald; Miller, James W.; Wernau, William C.; and Young, Thomas B., III, 4,639,322, Cl. 252-8.554.

Werth, Dee A.: *See*—
Knapp, Anthony W.; and Werth, Dee A., 4,639,064, Cl. 339-89.00M.

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Neuhaus, Josef, 4,639,050, Cl. 312-273.000.

Western Geophysical Co. of America: *See*—
Goodloe, Kent J., 4,639,905, Cl. 367-189.000.
Savit, Carl H., 4,639,729, Cl. 340-870.130.
Watson, Edward P., 4,638,662, Cl. 73-302.000.

Westhaver, Lawrence A.; and Ruksznis, Ronald E. Method and apparatus for battery charging. 4,639,655, Cl. 320-14.000.

Westinghouse Electric Corp.: *See*—
Archer, David H.; Bauer, Frank I.; and Vidt, Edward J., 4,638,629, Cl. 60-39.050.
Barry, Robert F., 4,639,591, Cl. 250-221.000.
Cooper, John H.; and South, William H., 4,639,817, Cl. 361-62.000.
Del Vecchio, Robert M.; and Specht, Theodore R., 4,639,610, Cl. 307-83.000.
Gottlieb, Milton; and Schaff, Fredrick L., 4,639,092, Cl. 350-372.000.
Grunert, Kurt A.; Walker, Roger E.; Paton, Charles R.; and Leone, David A., 4,639,564, Cl. 200-144.00R.
Johnson, Frederick O., 4,639,851, Cl. 363-164.000.
Ludwig, Richard H.; and Mikhail, Joanne E., 4,638,889, Cl. 187-29.00R.
Martens, Alan; and Snow, Bennie E., 4,638,630, Cl. 60-39.182.
Shallenberger, John M.; and Ferlan, Stephen J., 4,638,543, Cl. 29-426.500.
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Shestak, Edward J.; and Marschik, David, 4,639,700, Cl. 335-6.000.
Shimp, Alan B., 4,639,701, Cl. 335-21.000.
Wetherill, Todd M., 4,638,768, Cl. 122-512.000.
Zimmer, John J.; and Soltesz, Richard G., 4,638,667, Cl. 73-432.100.

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Weyerhaeuser Company: *See*—
Watson, Robert L., 4,638,941, Cl. 229-104.000.

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Wheatley, Donald G.; and Wheatley, Patricia A. Tonneau cover. 4,639,033, Cl. 296-100.000.

Wheatley, Patricia A.: *See*—
Wheatley, Donald G.; and Wheatley, Patricia A., 4,639,033, Cl. 296-100.000.

Whetstone, Wayne L.; and Tryan, Fredrick W., to Lake Center Industries. Ice thickness controller for an ice making machine. 4,638,640, Cl. 62-139.000.

Whirlpool Corporation: *See*—
Keane, James W., 4,639,055, Cl. 339-16.00R.

Whitcomb, Louis L.: *See*—
Day, Chia P.; Krause, Kenneth W.; Whitcomb, Louis L.; and Horn, Berthold K. P., 4,639,878, Cl. 364-513.000.

Whitehorn, Sydney H., to VSI Corporation. Nozzle assembly for die casting apparatus. 4,638,849, Cl. 164-311.000.

Wieczorek, Willibald: *See*—
Hoppmanns, Rolf D.; Steup, Walter; Wieczorek, Willibald; and Beitler, Franz, 4,639,801, Cl. 360-96.500.

Wierenga, Steven W.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

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Wierzgon, Achim: *See*—
Grenzendoerfer, Dietmar; Wierzgon, Achim; Mueller, Gerhard; Erth, Dieter; Guenther, Ludwig; and Kuenzel, Rolf, 4,638,647, Cl. 66-84.00A.

Wietek, Bernhard. Hollow foundation body and method of making a foundation. 4,639,168, Cl. 405-239.000.

Wilcox, Roger H. Adjustable room partition. 4,638,614, Cl. 52-238.100.

Wilczok, Norbert: *See*—
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.

Wild, Alan G.: *See*—
Baumgardner, Terry A.; Krouse, Jere L.; and Wild, Alan G., 4,639,200, Cl. 418-48.000.

William H. Rorer, Inc.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,639,442, Cl. 514-212.000.

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Williams, David A.; and Wright, Peter G., to Group Lotus Cap Companies PLC. Vehicle suspension arrangements. 4,639,013, Cl. 280-707.000.

Williams Patent Crusher and Pulverizer Company: *See*—
Williams, Robert M.; and Williams, Robert M., Jr., 4,638,952, Cl. 241-3.000.

Williams, Richard A.: *See*—
Jolitz, William L.; and Williams, Richard A., 4,639,385, Cl. 427-386.000.

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Williams, Robert M., Jr.: *See*—
Williams, Robert M.; and Williams, Robert M., Jr., 4,638,952, Cl. 241-3.000.

Willis, Donald H.; and Fling, Russell T., to RCA Corporation. Interlace to non-interlace scan converter for RGB format video input signals. 4,639,763, Cl. 358-11.000.

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Willis, Frank M.: *See*—
Luoma, Robert P., II; and Willis, Frank M., 4,639,317, Cl. 210-433.200.

Wilson, Bob T.: *See*—
Park, Arthur; and Wilson, Bob T., 4,638,872, Cl. 175-46.000.

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Wilson, Stanley: *See*—
Williams, Bertrand J.; and Wilson, Stanley, 4,639,661, Cl. 323-317.000.

Winfield Laboratories, Inc.: *See*—
Sims, Calvin L., 4,638,796, Cl. 128-155.000.

Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions. 4,639,473, Cl. 525-83.000.

Winiasz, Michael E., to Harris Graphics Corporation. Conveyor assembly. 4,638,906, Cl. 198-803.900.

Winter, Joseph: *See*—
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,638,535, Cl. 29-1.300.

Winters, Jack H., to AT&T Bell Laboratories. Wireless PBX/LAN system with optimum combining. 4,639,914, Cl. 370-110.100.

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Witco Chemical Corporation: *See*—
Percell, Kim S., 4,639,484, Cl. 524-318.000.

Wolcott, Herbert A., II, to Atlantic Richfield Company. Choke valve. 4,638,833, Cl. 137-312.000.

Wolfson, Elizabeth A.: *See*—
Sigl, Wayne C.; and Wolfson, Elizabeth A., 4,638,921, Cl. 221-1.000.

Wollar, Burnell J., to Phillips Plastics Corp. Self-sealing expansion rivet assembly. 4,639,175, Cl. 411-38.000.

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Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.

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Wong, Simon K. Y.: *See*—
Wong, John K. Y.; and Wong, Simon K. Y., 4,638,666, Cl. 73-431.000.

Wood, Derek A.; and Briner, Paul H., to Shell Oil Company. Preparation of 1-benzylazetidine-3-ol derivatives. 4,639,334, Cl. 548-952.000.

Wood, George A., to Charles Stark Draper Laboratory, Inc., The. Automated system for sequentially loading lowermost segments from a shingled stack of limp material segments. 4,638,749, Cl. 112-121.120.

Wood Manufacturing Co., Inc.: *See*—
Stone, Wayne B., Jr., 4,638,929, Cl. 222-456.000.

Woodruff, William D.: *See*—
Warmack, Ralph E.; and Woodruff, William D., 4,639,901, Cl. 367-13.000.

Woods, Alma J. Laterally stabilized bra strap. 4,638,513, Cl. 2-268.000.

Woods Wire Products, Inc.: *See*—
Upchurch, James E., 4,639,842, Cl. 362-376.000.

Woodstream Corporation: *See*—
Askins, William E., 4,638,589, Cl. 43-88.000.

Woodworth, Gary C.; and Roberts, Gary F., to Kartridg Pak Co., The. Tortilla folder. 4,638,729, Cl. 99-450.600.

Wooff, Edward A., Jr.: *See*—
Sluyter, Erik; and Wooff, Edward A., Jr., 4,639,772, Cl. 358-98.000.

Wortman, Rob: *See*—
Lee, James, 4,638,884, Cl. 181-141.000.

Wright, David A.; and Webb, David B., to Her Majesty the Queen in right of Canada. Survival kit air deployable apparatus and method. 4,639,229, Cl. 441-42.000.

Wright, Peter G.: *See*—
Williams, David A.; and Wright, Peter G., 4,639,013, Cl. 280-707.000.

Wu, Rong-Faa: *See*—
Fann, Yaw S.; and Wu, Rong-Faa, 4,639,025, Cl. 292-337.000.
Wulf, Rudolf; and Stager, Wolfgang, to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt e.V. Exhaust gas pipe cooled by ambient air. 4,638,632, Cl. 60-319.000.
Wullschleger, Andreas; and Brunner, Othmar, to ETA SA Fabriques d'Ebauches. Wristlet having links. 4,638,627, Cl. 59-80.000.
Wyant, James C.; and Prettyjohns, Keith N., to Wyko Corporation. Optical profiler using improved phase shifting interferometry. 4,639,139, Cl. 356-359.000.
Wyko Corporation: *See*—
Wyant, James C.; and Prettyjohns, Keith N., 4,639,139, Cl. 356-359.000.
Xerox Corporation: *See*—
Curry, Douglas N., 4,639,789, Cl. 358-285.000.
Drake, Donald J.; Hawkins, William G.; and Campanelli, Michael R., 4,639,748, Cl. 346-140.00R.
Huggins, Raymond W.; and Shoemaker, Ralph A., 4,638,986, Cl. 271-98.000.
Kershaw, Ian G., 4,638,988, Cl. 271-171.000.
Lin, Ying-wei, 4,639,115, Cl. 355-3.0DD.
Looney, John H., 4,639,121, Cl. 355-14.00R.
Mishra, Satchidanand; and Teuscher, Leon A., 4,639,402, Cl. 430-58.000.
Nye, Leroy M., Jr.; and Pike, Thomas W., 4,639,124, Cl. 355-15.000.
Pease, Donald L., 4,639,122, Cl. 355-15.000.
Wang, Shing C.; and Hamerdinger, Randolph W., 4,639,926, Cl. 372-87.000.
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat developable photosensitive material. 4,639,418, Cl. 430-617.000.
Yagi, Toshihiko: *See*—
Mochizuki, Yoshihara; Goto, Sohei; Yagi, Toshihiko; Yamazaki, Katsumasa; and Michiue, Kenji, 4,639,410, Cl. 430-506.000.
Yale Security Inc.: *See*—
Surko, Walter E., Jr., 4,638,651, Cl. 70-364.00A.
Yale University: *See*—
Schreiber, Stuart L., 4,639,532, Cl. 549-332.000.
Yamada, Akira: *See*—
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,638,646, Cl. 62-478.000.
Yamada, Hirokazu: *See*—
Johdai, Akiyoshi; Yamada, Hirokazu; Ikenoue, Yoshikazu; and Ishikawa, Takuma, 4,638,992, Cl. 271-293.000.
Yamada Iryo Shomei Kabushiki Kaisha: *See*—
Kato, Yasuhiro; and Koyama, Mitsuhiro, 4,639,838, Cl. 362-33.000.
Yamada, Kazuo: *See*—
Yamaguchi, Hirohisa; and Yamada, Kazuo, 4,639,778, Cl. 358-135.000.
Yamada, Koji: *See*—
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 346-194.000.
Yamada, Takahiro, to Matsushita Electric Industrial Co., Ltd. Semiconductor device. 4,639,753, Cl. 357-22.000.
Yamada, Tetsuo: *See*—
Matsunobu, Akira; Horishita, Sumio; and Yamada, Tetsuo, 4,639,374, Cl. 426-43.000.
Yamagawa, Masato; and Tsukada, Keizo, to Sony Corporation. Cordless telephone. 4,639,550, Cl. 379-62.000.
Yamaguchi, Hirohisa; and Yamada, Kazuo, to Kokusai Denshin Denwa Co., Ltd. Embedding quantization system for vector signals. 4,639,778, Cl. 358-135.000.
Yamaguchi, Shigeri: *See*—
Taniguchi, Koki; Yamaguchi, Shigeri; and Nakayama, Keiji, 4,639,062, Cl. 339-59.00M.
Yamaguchi, Shunzo: *See*—
Kobayashi, Akihiro; Yamaguchi, Shunzo; Kobayashi, Kiyomi; and Takaba, Hiroaki, 4,639,712, Cl. 338-238.000.
Yamaguchi, Soji: *See*—
Ueno, Michio; Miyagi, Toshimi; and Yamaguchi, Soji, 4,639,663, Cl. 323-356.000.
Yamaguchi, Susumu: *See*—
Watanabe, Tetsumi; Yamaguro, Akira; and Yamaguchi, Susumu, 4,639,212, Cl. 431-183.000.
Yamaguchi, Takashi; Nagasawa, Naomi; and Tamura, Hidemasa, to Sony Corporation. Ceramic substrate of Na_2O and Nb_2O_5 for magnetic metal thin film. 4,639,400, Cl. 428-694.000.
Yamaguro, Akira: *See*—
Watanabe, Tetsumi; Yamaguro, Akira; and Yamaguchi, Susumu, 4,639,212, Cl. 431-183.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Aoi, Kazuo, 4,638,774, Cl. 123-90.220.
Yamakami, Takahiko: *See*—
Hata, Katsuhiko; and Yamakami. Takahiko, 4,639,640, Cl. 315-3.000.
Yamakawa, Tsutomu: *See*—
Nakata, Hozumi; and Yamakawa, Tsutomu, 4,639,632, Cl. 310-351.000.
Yamamoto, Hiroshi: *See*—
Fuziwara, Yutaka; and Yamamoto, Hiroshi, 4,639,083, Cl. 350-255.000.
Yamamoto, Mitsuru; Watanabe, Kunio; and Shimoda, Junji, to Canon Kabushiki Kaisha. Apparatus for driving liquid jet head. 4,639,735, Cl. 346-1.100.
Yamamoto, Mitsuru, to Canon Kabushiki Kaisha. Image recording apparatus. 4,639,746, Cl. 346-140.00R.
Yamamoto, Shigehiko, to Hitachi, Ltd. Thin film formation technique and equipment. 4,639,377, Cl. 427-10.000.
Yamamoto, Soichiro; and Shimada, Takeo, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,639,409, Cl. 430-505.000.
Yamamoto, Takemi; and Tomida, Yasutaka, to Brother Kogyo Kabushiki Kaisha. Printing apparatus with a thermal print head. 4,639,152, Cl. 400-120.000.
Yamamoto, Yasuo: *See*—
Tanaka, Kazuhiro; Yamamoto, Yasuo; Hanaoka, Katsumi; and Hirai, Masatake, 4,639,707, Cl. 336-185.000.
Yamamoto, Yoshinori, to Daikyo Service Station Development Co. Ltd. Checker for air conditioner. 4,638,671, Cl. 73-708.000.
Yamanaka, Hideaki: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,639,448, Cl. 514-226.000.
Yamanaka, Yasutoshi; Ageishi, Kazunobu; and Izumida, Teruo, to Nippondenso Co., Ltd. Oil filter and cooler for internal combustion engine. 4,638,856, Cl. 165-119.000.
Yamasaki, Kojiro. Metal mould and venthole arrangement thereof. 4,638,848, Cl. 164-305.000.
Yamashita, Keitaro: *See*—
Fukae, Kensuke; and Yamashita, Keitaro, 4,639,116, Cl. 355-3.0DD.
Yamashita, Naoki: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,638,710, Cl. 84-1.260.
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, to Eisai Co., Ltd. Polyprenylcarboxylic acid morpholides and pharmaceutical compositions. 4,639,450, Cl. 514-238.000.
Yamazaki, Katsumasa: *See*—
Mochizuki, Yoshihara; Goto, Sohei; Yagi, Toshihiko; Yamazaki, Katsumasa; and Michiue, Kenji, 4,639,410, Cl. 430-506.000.
Yanagase, Akira: *See*—
Murashige, Yoshio; Yanagase, Akira; Kawachi, Yasunori; and Soga, Junko, 4,639,339, Cl. 260-513.600.
Yanagi, Kenichi: *See*—
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.
Yanagisawa, Shuichi: *See*—
Matsui, Fumio; Yanagisawa, Shuichi; Kakuta, Yoshiyuki; and Yoshizawa, Atsushi, 4,639,745, Cl. 346-135.100.
Yang, James H. C.; and Tomaszewski, Walter, to Firestone Tire & Rubber Company, The. Mechanical fastening system. 4,638,532, Cl. 24-462.000.
Yang, Yan Y.; and Tsair, Chu H., to Tsai, Ming Cherng. Structure for bed. 4,638,517, Cl. 5-236.00R.
Yarne, Andrew J.; and Burr, Eldon F., to Rockwell International Corporation. Vapor phase bonding for RF microstrip line circuits. 4,638,938, Cl. 228-180.100.
Yarranton, Arthur; Chase, Charles E., Jr.; and Picquendar, Jean E., to Raytheon Company. Temperature compensation circuitry. 4,639,697, Cl. 333-155.000.
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, to Diesel Kiki Co., Ltd. Apparatus for controlling fuel injection timing in a fuel injection pump. 4,638,782, Cl. 123-502.000.
Yasuhiro, Miki, to Brother Industries, Ltd. Ribbon feed system of combined printer. 4,639,880, Cl. 364-519.000.
Yasukawa, Takemasa: *See*—
Sugita, Hiroshi; Iwasa, Tadanobu; Yasukawa, Takemasa; and Aritake, Masanori, 4,638,525, Cl. 15-250.360.
Yasumoto, Hiromi: *See*—
Suzuki, Hirosuke; Yasumoto, Hiromi; and Umemoto, Hiroshi, 4,639,693, Cl. 333-1.000.
Yatabe, Toshiaki; Nishihara, Toshio; and Suzuki, Nobuo, to Teijin Limited. Optical laminar structure. 4,639,069, Cl. 350-1.700.
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., to Xerox Corporation. Electro-optic pulse imaging raster output scanner. 4,639,073, Cl. 350-6.800.
Yokoo, Nobuo: *See*—
Fujii, Setsuro; Yokoyama, Touru; Ikegaya, Kouji; Yokoo, Nobuo; and Nagakura, Masahiko, 4,639,435, Cl. 514-11.000.
Yokota, Akira, to Olympus Optical Co., Ltd. Illuminating optical system for high magnification endoscopes. 4,639,837, Cl. 362-32.000.
Yokota, Shinichi: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Yokoyama, Touru: *See*—
Fujii, Setsuro; Yokoyama, Touru; Ikegaya, Kouji; Yokoo, Nobuo; and Nagakura, Masahiko, 4,639,435, Cl. 514-11.000.
Yoneyama, Yoshio: *See*—
Inaba, Mitsuharu; Sekiguchi, Takashi; Yoneyama, Yoshio; and Suzuki, Tadashi, 4,639,182, Cl. 414-543.000.

Yoshida, Haruhiko: *See*—
Takemura, Tohru; Nakashima, Atushi; Yoshida, Haruhiko; Kamo, Jun; and Hamada, Eiichi, 4,639,353, Cl. 422-46.000.
Yoshida, Hiroshi: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,638,710, Cl. 84-1.260.
Yoshida Kogyo K. K.: *See*—
Akiyama, Hideki; and Imai, Shigeru, 4,638,542, Cl. 29-408.000.
Yoshida, Masayuki, to Pioneer Electronic Corporation. Switching circuit for a power supply in a signal processing apparatus. 4,639,660, Cl. 323-266.000.
Yoshida, Tetsuo; and Kokubo, Tadayoshi, to Fuji Photo Film Co., Ltd. Internal latent image-type silver halide emulsion. 4,639,416, Cl. 430-567.000.
Yoshihara, Mitsuo: *See*—
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.
Yoshikawa, Hiroki: *See*—
Sakazume, Akio; Yoshikawa, Hiroki; and Matsushima, Hiroeki, 4,638,643, Cl. 62-209.000.
Yoshikawa, Mitsuhiko: *See*—
Kira, Toru; Miyauchi, Teiichi; and Yoshikawa, Mitsuhiko, 4,639,806, Cl. 360-113.000.
Yoshimura, Nobutoshi: *See*—
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.
Yoshimura, Noriaki: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Yoshimura, Toshio: *See*—
Tanaka, Shinsaku; and Yoshimura, Toshio, 4,639,800, Cl. 360-90.000.
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, to Hitachi, Ltd. Thrust bearing. 4,639,146, Cl. 384-99.000.
Yoshioka, Takeo. Water pipe. 4,638,815, Cl. 131-173.000.
Yoshioka, Toshiharu: *See*—
Morioka, Minoru; Kishi, Toshiaki; and Yoshioka, Toshiharu, 4,638,881, Cl. 180-219.000.
Yoshiwara, Seishiro; and Kawanami, Takao, to Nippon Steel Corporation. Method for producing a clad plate by rolling. 4,638,939, Cl. 228-186.000.
Yoshizawa, Atsushi: *See*—
Matsui, Fumio; Yanagisawa, Shuichi; Kakuta, Yoshiyuki; and Yoshizawa, Atsushi, 4,639,745, Cl. 346-135.100.
Young, Lawrence R.; Sexton, Gregory J.; Mullins, Randal L.; and Bradley, Brian D., to Eastman Kodak Company. Ink level detection system for ink jet printing apparatus. 4,639,738, Cl. 346-75.000.
Young, Thomas B., III: *See*—
Beck, Donald; Miller, James W.; Wernau, William C.; and Young, Thomas B., III, 4,639,322, Cl. 252-8.554.
Youngblood, James F.: *See*—
Schellstede, Herman J.; and Youngblood, James F., 4,639,258, Cl. 55-52.000.
Yousey, Kevin E.: *See*—
Ville, Ivan B.; Walling, James D.; and Yousey, Kevin E., 4,638,759, Cl. 118-657.000.
Yu, Yuan-Fu: *See*—
Seyferth, Dietmar; and Yu, Yuan-Fu, 4,639,501, Cl. 528-15.000.
Yudichak, Joseph R.: *See*—
Toegel, Herbert J.; Yudichak, Joseph R.; and Gilsdorf, John F., 4,639,910, Cl. 370-58.000.
Yutani, Takashi: *See*—
Asaeda, Takeaki; Nakamura, Toru; and Yutani, Takashi, 4,639,850, Cl. 363-58.000.
Zaglin, Lawrence C.: *See* –
Fetko, Paul; and Zaglin, Lawrence C., 4,639,102, Cl. 350-626.000.
Zeller Plastik Koehn, Graebner & Co.: *See*—
Persch, Alois, 4,638,917, Cl. 215-252.000.
Zenith Electronics Corporation: *See*—
Meyle, William H.; and Wendt, Paul H., 4,639,230, Cl. 445-30.000.
Zerowin, Jeffrey H. Data terminal system. 4,639,583, Cl. 235-380.000.
Zeuner, Kenneth W.; Zeuner, Steven K.; and Zeuner, Thomas A. Electrohydraulic valve assemblies and method. 4,638,974, Cl. 251-129.150.
Zeuner, Steven K.: *See*—
Zeuner, Kenneth W.; Zeuner, Steven K.; and Zeuner, Thomas A., 4,638,974, Cl. 251-129.150.
Zeuner, Thomas A.: *See*—
Zeuner, Kenneth W.; Zeuner, Steven K.; and Zeuner, Thomas A., 4,638,974, Cl. 251-129.150.
Zijlstra, Hinne, to U.S. Philips Corporation. Nuclear magnetic resonance apparatus with a magnet of permanent magnetic material. 4,639,673, Cl. 324-319.000.
Zimmer, John J.; and Soltesz, Richard G., to Westinghouse Electric Corp. Remote probe positioning apparatus. 4,638,667, Cl. 73-432.100.
Zingher, Oded, to M.A.N.-Roland Druckmaschinen AG. Data input unit and method for printing machines. 4,639,881, Cl. 364-521.000.
Zinke, Horst: *See*—
Muller, Horst; Zinke, Horst; and Wehner, Wolfgang, 4,639,482, Cl. 524-137.000.
Zipperian, Donald E., to Deister Concentrator Company, The. Floatation apparatus for concentration of minerals from high water content aqueous slurries. 4,639,313, Cl. 209-170.000.
Zollner, Dieter: *See*—
Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, 4,639,928, Cl. 373-93.000.
Zumbusch, Steven J., to Eaton Corporation. Rotary fluid pressure device having free-wheeling capability. 4,639,203, Cl. 418-61.00B.
Zunkel, Gary D.; and Bolin, Michael L., to Halliburton Company. Gravel packer. 4,638,859, Cl. 166-51.000.
Zuranski, Edward S.; Scott, Robert E.; and Betts, William L., to Paradyne Corporation. Line impairment display for digital modems. 4,639,934, Cl. 375-10.000.
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr. Apparatus for stabilization of low-temperature plasma of an arc burner. 4,639,570, Cl. 219-121.0PP.
20th Century Machine: *See*—
Miller, Michael A., 4,638,548, Cl. 29-558.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JANUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., to Baxter Travenol Laboratories, Inc. Gripper member for retention of a plastic tube. Re. 32,338, Cl. 294-16.000.

Baxter Travenol Laboratories, Inc.: *See*—
Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., Re. 32,338, Cl. 294-16.000.

Dart Industries Inc.: *See*—
Dobson, William C.; and Spoeth, Carl R., Re. 32,340, Cl. 200-50.00B.

Dennehey, Michael T.: *See*—
Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., Re. 32,338, Cl. 294-16.000.

Dictaphone Corporation: *See*—
Wilder, Leslie N.; Whitney, James C.; and Matison, Gary G., Re. 32,342, Cl. 360-72.200.

Dobson, William C.; and Spoeth, Carl R., to Dart Industries Inc. Electrical switch-plug assembly with baffle. Re. 32,340, Cl. 200-50.00B.

Escaron, Pierre C.; and Hoppe, Joachim A., to Schlumberger Technology Corporation. Method and apparatus for conducting logging or perforating operations in a borehole. Re. 32,336, Cl. 166-250.000.

Greff, Richard J.: *See*—
Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., Re. 32,338, Cl. 294-16.000.

Heck, Betty M. Fluid administration splint. Re. 32,335, Cl. 128-88.000.

Hoppe, Joachim A.: *See*—
Escaron, Pierre C.; and Hoppe, Joachim A., Re. 32,336, Cl. 166-250.000.

Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., to United Technologies Corporation. Blade to blade vibration damper. Re. 32,339, Cl. 416-190.000.

Matison, Gary G.: *See*—
Wilder, Leslie N.; Whitney, James C.; and Matison, Gary G., Re. 32,342, Cl. 360-72.200.

Munsch, John M.: *See*—
Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., Re. 32,338, Cl. 294-16.000.

Oizumi, Yoshio, to Yamakyu Automatics Co., Ltd. System for conveying conical articles. Re. 32,337, Cl. 198-463.600.

Schlumberger Technology Corporation: *See*—
Escaron, Pierre C.; and Hoppe, Joachim A., Re. 32,336, Cl. 166-250.000.

Sifford, Perry P.: *See*—
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., Re. 32,339, Cl. 416-190.000.

Smith, Robert M. Disco light assembly. Re. 32,341, Cl. 315-291.000.

Spoeth, Carl R.: *See*—
Dobson, William C.; and Spoeth, Carl R., Re. 32,340, Cl. 200-50.00B.

Sutton, Joel F.: *See*—
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., Re. 32,339, Cl. 416-190.000.

United Technologies Corporation: *See*—
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., Re. 32,339, Cl. 416-190.000.

Whitney, James C.: *See*—
Wilder, Leslie N.; Whitney, James C.; and Matison, Gary G., Re. 32,342, Cl. 360-72.200.

Wilder, Leslie N.; Whitney, James C.; and Matison, Gary G., to Dictaphone Corporation. Instruction indicating apparatus for a record and/or playback device. Re. 32,342, Cl. 360-72.200.

Yamakyu Automatics Co., Ltd.: *See*—
Oizumi, Yoshio, Re. 32,337, Cl. 198-463.600.

LIST OF DESIGN PATENTEES

Aadahl, Frank P.: *See*—
Watkins, Donald E.; and Aadahl, Frank P., 288,016, Cl. D32-22.000.

Abrams, Robert C.: *See*—
Weder, Donald E.; Weder, Erwin; and Abrams, Robert C., 287,950, Cl. D11-143.000.

Adams, Larry C. Combined support for holding and displaying cards. 287,980, 1-27-87, Cl. D19-86.000.

Adcock, D. L. Machine for filtering lubricating oil for a dough divider machine. 287,926, 1-27-87, Cl. D7-368.000.

Airwick Industries, Inc.: *See*—
Hoyt, Earl, 288,003, Cl. D23-150.000.

Albertson, Robert V., to Burd, Bartz & Gutenkauf. Coin-operated telephone box. 287,966, 1-27-87, Cl. D14-55.000.

American Commercial, Incorporated: *See*—
Levien, Robin, 287,918, Cl. D7-19.000.

Ampere Incorporated: *See*—
Kusanagi, Takashi, 287,969, Cl. D14-106.000.

Anzelone, Thomas A.; Davis, Myron F.; and Jordan, Willis Y., III, to International Business Machines Corporation. Keyboard for a personal computer. 287,972, 1-27-87, Cl. D14-100.000.

Apple Computer, Inc.: *See*—
Gemmell, Rob J.; Esslinger, Hartmut H.; and Peart, Stephen, 287,967, Cl. D14-100.000.

Ares, Roland A.; and Maechler, Dennis R., to Hussmann Corporation. Air cooled refrigeration condenser. 288,002, 1-27-87, Cl. D23-139.000.

Astra Lakemedel Aktiebolag: *See*—
Bergstrom, Nils-Gustaf; and Lanfelt, Stig B., 288,006, Cl. D24-63.000.

Au, William G.: *See*—
Gebhard, Albert W.; Au, William G.; and Parker, Robert M., 288,019, Cl. D32-37.000.

Baxter Travenol Laboratories, Inc.: *See*—
Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., 288,005, Cl. D24-61.000.

Bayerische Motoren Werke AG: *See*—
Boyer, Boyke, 287,960, Cl. D12-211.000.

Bech, Frank W. Bottle. 287,935, 1-27-87, Cl. D9-372.000.

Bergstrom, Nils-Gustaf; and Lanfelt, Stig B., to Astra Lakemedel Aktiebolag. Disposable syringe for storing and administering pharmaceutical preparations. 288,006, 1-27-87, Cl. D24-63.000.

Bidwell, Christopher C.: *See*—
Knight, James L.; and Bidwell, Christopher C., 287,913, Cl. D6-409.000.

Billinghurst, Andrew J., to Hestair Kiddicraft Limited. Toy ball. 287,988, 1-27-87, Cl. D21-204.000.

Blachly, Donald L., to Gerber Products Company. Breast pump. 288,004, 1-27-87, Cl. D24-51.000.

Black & Decker, Inc.: *See*—
Somers, Robert I., 287,930, Cl. D8-64.000.
Verdier, Alain; and Polly, Marc, 288,015, Cl. D32-18.000.

Bollinger, Steven N.: *See*—
Dayton, William A.; Crain, John E.; and Bollinger, Steven N., 287,958, Cl. D12-169.000.

Bonczek, John F.; and Bonczek, Linda D. Combined shelves and dispenser for disposable diapers. 287,915, 1-27-87, Cl. D6-515.000.

Bonczek, Linda D.: *See*—
Bonczek, John F.; and Bonczek, Linda D., 287,915, Cl. D6-515.000.

Bond, Raymond G., to Fortel, Inc. Cordless handset and stand telephone unit. 287,971, 1-27-87, Cl. D14-53.000.

Boyd Lighting Company: *See*—
Pfister, Murray C., 288,009, Cl. D26-145.000.

Boyer, Boyke, to Bayerische Motoren Werke AG. Wheel cover. 287,960, 1-27-87, Cl. D12-211.000.

Brechtbill, George V.; and Nicolos, Charlie O., to Nicolos, Charlie O. Brace for stabilizer of V-tail aircraft. 287,962, 1-27-87, Cl. D12-345.000.

Bremer, David R. Coffee filter separating utensil. 287,922, 1-27-87, Cl. D7-99.000.

Bridgestone Corporation: *See*—
Hayakawa, Toshio; and Tomura, Atsushi, 287,955, Cl. D12-147.000.
Hayakawa, Toshio; Tomura, Atsushi; and Nishio, Hideaki, 287,957, Cl. D12-147.000.
Kawajiri, Junichi; and Hayakawa, Toshio, 287,952, Cl. D12-136.000.
Nishio, Hideaki; and Matsuda, Kazuo, 287,956, Cl. D12-147.000.
Tomura, Atsushi; and Nishio, Hideaki, 287,954, Cl. D12-147.000.

Broan Mfg. Co., Inc.: *See—*
Jonas, Kenneth J.; Lazar, Ralph M.; and Wolbrink, David W., 288,007, Cl. D26-51.000.

Bulgari, Gianni, to Partecipazioni Bulgari S.p.A. Necklace. 287,949, 1-27-87, Cl. D11-6.000.

Burd, Bartz & Gutenkauf: *See—*
Albertson, Robert V., 287,966, Cl. D14-55.000.

Cannon, Albert W., to Focal Point Limited. Sight. 287,977, 1-27-87, Cl. D16-132.000.

Carder, Mervin L., Sr., to M. Carder Industries, Inc. Splash guard for a fuel dispensing nozzle. 287,996, 1-27-87, Cl. D23-36.000.

Casnovsky, William M.: *See—*
Ng, Edward C.; and Casnovsky, William M., 287,968, Cl. D14-106.000.

Champion Spark Plug Company: *See—*
Jones, James E., deceased; and Grime, Thomas E., 287,994, Cl. D23-18.000.

Chong, Chae Y. Device for collecting and removing fireplace ashes. 288,001, 1-27-87, Cl. D23-131.000.

Chrysler Motors Corporation: *See—*
Dayton, William A.; Crain, John E.; and Bollinger, Steven N., 287,958, Cl. D12-169.000.

Clemens, Jack D., to Solo Cup Company. Drinking cup lid. 287,919, 1-27-87, Cl. D7-40.000.

Coiclasure, George M. Novelty golf ball figure. 287,987, 1-27-87, Cl. D21-155.000.

Crain, John E.: *See—*
Dayton, William A.; Crain, John E.; and Bollinger, Steven N., 287,958, Cl. D12-169.000.

Crone, Jerry L., to Hill-Rom Company, Inc. Mounting block. 287,931, 1-27-87, Cl. D8-373.000.

Crow, Herman L. Liquid dispenser. 287,993, 1-27-87, Cl. D23-17.000.

Danley, Allen M.: *See—*
Pomroy, James F.; Danley, Allen M.; and Rubbright, Harry A., 287,917, Cl. D7-18.000.

Dansk Pressalit A/S: *See—*
Holscher, Knud H., 287,998, Cl. D23-71.000.

Dart Industries Inc.: *See—*
Picozza, Augusto A., 287,983, Cl. D21-48.000.

Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., to International Business Machines Corporation. Floor standing enclosure for personal computer. 287,974, 1-27-87, Cl. D14-114.000.

Davis, Myron F.: *See—*
Anzelone, Thomas A.; Davis, Myron F.; and Jordan, Willis Y., III, 287,972, Cl. D14-100.000.

Dayton, William A.; Crain, John E.; and Bollinger, Steven N., to Chrysler Motors Corporation. Automobile bumper. 287,958, 1-27-87, Cl. D12-169.000.

DeGroff, Wilbur E. Bowling pin clock. 287,940, 1-27-87, Cl. D10-6.000.

DelGarbino, Andrea F.; and DelGarbino, David L. Wall mounted bracket for use in beauty salons and the like. 287,916, 1-27-87, Cl. D6-567.000.

DelGarbino, David L.: *See—*
DelGarbino, Andrea F.; and DelGarbino, David L., 287,916, Cl. D6-567.000.

De Luca, Paul: *See—*
Fasano, Michael; and De Luca, Paul, 287,963, Cl. D13-24.000.

Enyi, Donatus O. Game board or similar article. 287,982, 1-27-87, Cl. D21-34.000.

Esslinger, Hartmut H.: *See—*
Gemmell, Rob J.; Esslinger, Hartmut H.; and Peart, Stephen, 287,967, Cl. D14-100.000.

Evans, Edwin C. Traffic light. 287,948, 1-27-87, Cl. D10-115.000.

Fasano, Michael; and De Luca, Paul, to Porta Systems Corp. Telephone building entrance terminal. 287,963, 1-27-87, Cl. D13-24.000.

Faulkenberry, Eulice E. Fireless ashtray. 288,010, 1-27-87, Cl. D27-8.000.

Ferguson, Kenneth F. Shower flow controller. 287,995, 1-27-87, Cl. D23-19.000.

Ferrero, Pietro, to Ferrero S.p.A. Display stand. 287,912, 1-27-87, Cl. D6-408.000.

Ferrero S.p.A.: *See—*
Ferrero, Pietro, 287,912, Cl. D6-408.000.

Focal Point Limited: *See—*
Cannon, Albert W., 287,977, Cl. D16-132.000.

Forsyth, James A., to Sorbothane, Inc. Insole. 287,902, 1-27-87, Cl. D2-318.000.

Fortel, Inc.: *See—*
Bond, Raymond G., 287,971, Cl. D14-53.000.

Fox, Saul. Hanger. 287,908, 1-27-87, Cl. D6-328.000.

Gebhard, Albert W.; Au, William G.; and Parker, Robert M., to Gerico, Inc. Diaper pail. 288,019, 1-27-87, Cl. D32-37.000.

Gemmell, Rob J.; Esslinger, Hartmut H.; and Peart, Stephen, to Apple Computer, Inc. Personal computer housing. 287,967, 1-27-87, Cl. D14-100.000.

Gerber Products Company: *See—*
Blachly, Donald L., 288,004, Cl. D24-51.000.

Gerico, Inc.: *See—*
Gebhard, Albert W.; Au, William G.; and Parker, Robert M., 288,019, Cl. D32-37.000.

Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., to Baxter Travenol Laboratories, Inc. Needle hub. 288,005, 1-27-87, Cl. D24-61.000.

Goetz, Fred E.: *See—*
Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., 287,974, Cl. D14-114.000.

Gold, Ronald: *See—*
Kornhaber, Eugene; and Gold, Ronald, 287,989, Cl. D21-207.000.

Greene, Leonard M., to Safe Flight Instrument Corporation. Boat hull. 287,961, 1-27-87, Cl. D12-300.000.

Grime, Thomas E.: *See—*
Jones, James E., deceased; and Grime, Thomas E., 287,994, Cl. D23-18.000.

GTE Government Systems Corporation: *See—*
Kasianowicz, John E.; and Landes, Michael L., 287,965, Cl. D13-99.000.

Hagg, Jan O.; and Persson, Lars-Olov, to Pressmaster Tool AB. Crimping tool. 287,929, 1-27-87, Cl. D8-51.000.

Harada, Toshio: *See—*
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,924, Cl. D7-351.000.
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,925, Cl. D7-351.000.

Harman, Walter D. Sprinkler spout closure. 287,939, 1-27-87, Cl. D9-447.000.

Harris, James C.: *See—*
Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., 287,974, Cl. D14-114.000.

Harris, Robert M., Jr., to McKesson Corporation. Plastic bottle for liquids. 287,934, 1-27-87, Cl. D9-370.000.

Hastings, Malcolm B.: *See—*
Seward, Barry; Woolman, Paul; Pope, Kevin C.; Redshaw, Digby R.; Hastings, Malcolm B.; and Withall, Malcolm D. N., 287,932, Cl. D9-305.000.

Hayakawa, Toshio; and Tomura, Atsushi, to Bridgestone Corporation. Motorcycle tire. 287,955, 1-27-87, Cl. D12-147.000.

Hayakawa, Toshio; Tomura, Atsushi; and Nishio, Hideaki, to Bridgestone Corporation. Motorcycle tire. 287,957, 1-27-87, Cl. D12-147.000.

Hayakawa, Toshio: *See—*
Kawajiri, Junichi; and Hayakawa, Toshio, 287,952, Cl. D12-136.000.

Hestair Kiddicraft Limited: *See—*
Billinghurst, Andrew J., 287,988, Cl. D21-204.000.
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,984, Cl. D21-122.000.

Hewston, Leslie R. Construction tool. 287,944, 1-27-87, Cl. D10-64.000.

Heywood, R. G.: *See—*
Laughlin, Jennifer, 287,901, Cl. D2-252.000.

Hicks, Irwin A.; and Schroeck, Joseph P., to Singer Company, The. Housing for a remote meter display. 287,947, 1-27-87, Cl. D10-102.000.

Highland Supply Corporation: *See—*
Weder, Donald E.; Weder, Erwin; and Abrams, Robert C., 287,950, Cl. D11-143.000.

Hill-Rom Company, Inc.: *See—*
Crone, Jerry L., 287,931, Cl. D8-373.000.

Holscher, Knud H., to Dansk Pressalit A/S. Combined toilet seat and cover, or similar article. 287,998, 1-27-87, Cl. D23-71.000.

Honma, Keizo. Air eliminator for plumbing systems. 287,997, 1-27-87, Cl. D23-46.000.

Hooper, William A., Jr. Spare tire carrier. 287,959, 1-27-87, Cl. D12-202.000.

Howell, Steven E.: *See—*
Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., 287,974, Cl. D14-114.000.

Hoyt, Earl, to Airwick Industries, Inc. Housing for air freshener. 288,003, 1-27-87, Cl. D23-150.000.

Hussmann Corporation: *See—*
Ares, Roland A.; and Maechler, Dennis R., 288,002, Cl. D23-139.000.

Ichihara, Masuo: *See—*
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,924, Cl. D7-351.000.
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,925, Cl. D7-351.000.

Industrial Maintenance Systems, Inc.: *See—*
Zatezalo, John M., 287,978, Cl. D18-7.000.

International Business Machines Corporation: *See—*
Anzelone, Thomas A.; Davis, Myron F.; and Jordan, Willis Y., III, 287,972, Cl. D14-100.000.
Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., 287,974, Cl. D14-114.000.

Jonas, Kenneth J.; Lazar, Ralph M.; and Wolbrink, David W., to Broan Mfg. Co., Inc. Combination deodorizer and light. 288,007, 1-27-87, Cl. D26-51.000.

Jones, Amy T., executor: *See—*
Jones, James E., deceased; and Grime, Thomas E., 287,994, Cl. D23-18.000.

Jones, James E., deceased (by Jones, Amy T., executor); and Grime, Thomas E., to Champion Spark Plug Company. Paint cup yoke. 287,994, 1-27-87, Cl. D23-18.000.

Jones, Michael R.; and Jones, Samuel N. Shoe sole. 287,903, 1-27-87, Cl. D2-321.000.

Jones, Samuel N.: *See—*
Jones, Michael R.; and Jones, Samuel N., 287,903, Cl. D2-321.000.

Jordan, Willis Y., III: *See—*
Anzelone, Thomas A.; Davis, Myron F.; and Jordan, Willis Y., III, 287,972, Cl. D14-100.000.

Kabushiki Kaisha Nagaoka: *See*—
Kawabe, Hirokazu, 288,018, Cl. D32-35.000.
Kaku, Noriaki, to Matsushita Electric Industrial Co., Ltd. Telephone answering machine. 287,970, 1-27-87, Cl. D14-4.000.
Kasianowicz, John E.; and Landes, Michael L., to GTE Government Systems Corporation. Combined housing for bias components and connector therefor. 287,965, 1-27-87, Cl. D13-99.000.
Kato, Shigemasa; and Takada, Sanae, to Tokyo Juki Industrial Co., Ltd. Serial printer. 287,973, 1-27-87, Cl. D14-111.000.
Kawabe, Hirokazu, to Kabushiki Kaisha Nagaoka. Case for a compact disc surface cleaning device and compact disc cleaning support. 288,018, 1-27-87, Cl. D32-35.000.
Kawajiri, Junichi; and Hayakawa, Toshio, to Bridgestone Corporation. Motorcycle tire. 287,952, 1-27-87, Cl. D12-136.000.
Klamer, Reuben B., to Quaker Oats Company, The. Roller skate. 287,990, 1-27-87, Cl. D21-226.000.
Knight, James L.; and Bidwell, Christopher C. Carpet display stand. 287,913, 1-27-87, Cl. D6-409.000.
Koida, Kazushi: *See*—
Nakazawa, Hiroshi; and Koida, Kazushi, 287,976, Cl. D16-1.000.
Kornhaber, Eugene; and Gold, Ronald. Shuttlecock. 287,989, 1-27-87, Cl. D21-207.000.
Kruger, Robert J.: *See*—
Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., 288,005, Cl. D24-61.000.
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 287,924, 1-27-87, Cl. D7-351.000.
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 287,925, 1-27-87, Cl. D7-351.000.
Kusanagi, Takashi, to Ampere Incorporated. Portable electronic computer. 287,969, 1-27-87, Cl. D14-106.000.
Landes, Michael L.: *See*—
Kasianowicz, John E.; and Landes, Michael L., 287,965, Cl. D13-99.000.
Lanfelt, Stig B.: *See*—
Bergstrom, Nils-Gustaf; and Lanfelt, Stig B., 288,006, Cl. D24-63.000.
Lanier, James R. Container holder. 287,920, 1-27-87, Cl. D7-70.000.
Larime, Michael W.: *See*—
Sargent, Charles L.; Larime, Michael W.; and Selina, John R., 287,937, Cl. D9-375.000.
Laughlin, Jennifer, to Wyss, B. O.; Wyss, E. L.; and Heywood, R. G., part interest to each. Novelty sun visor. 287,901, 1-27-87, Cl. D2-252.000.
Lazar, Ralph M.: *See*—
Jonas, Kenneth J.; Lazar, Ralph M.; and Wolbrink, David W., 288,007, Cl. D26-51.000.
Levien, Robin, to American Commercial, Incorporated. Cream pitcher. 287,918, 1-27-87, Cl. D7-19.000.
Lin, Johnny K., to 3L Plastics USA, Inc. Mouse figures toy. 287,985, 1-27-87, Cl. D21-149.000.
Linton, Paul W. Gas fired hot water pressure cleaning apparatus. 288,017, 1-27-87, Cl. D32-25.000.
Lummis, Michael G., to P.T.C., Inc. Lure. 287,991, 1-27-87, Cl. D22-129.000.
M. Carder Industries, Inc.: *See*—
Carder, Mervin L., Sr., 287,996, Cl. D23-36.000.
Maechler, Dennis R.: *See*—
Ares, Roland A.; and Maechler, Dennis R., 288,002, Cl. D23-139.000.
Matsuda, Kazuo: *See*—
Nishio, Hideaki; and Matsuda, Kazuo, 287,956, Cl. D12-147.000.
Matsui, Tomotoshi, to Tomy Kogyo, Inc. Toy robot. 287,986, 1-27-87, Cl. D21-150.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kaku, Noriaki, 287,970, Cl. D14-4.000.
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,924, Cl. D7-351.000.
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,925, Cl. D7-351.000.
McKesson Corporation: *See*—
Harris, Robert M., Jr., 287,934, Cl. D9-370.000.
McLennan, William R.; and Rung, Robert, to Victaulic Company of America. Yoke for a sprinkler. 287,992, 1-27-87, Cl. D23-7.000.
McMahon, Gordon E. Grill for motorcycle light. 288,008, 1-27-87, Cl. D26-139.000.
McNally, Lawrence J. Collator. 287,981, 1-27-87, Cl. D19-92.000.
Mills, Frederick G. W.; and Piercy, Michael, to United Glass Limited; and Universal Wines & Spirits Limited. Bottle. 287,933, 1-27-87, Cl. D9-349.000.
Mills, Frederick G. W.; and Piercy, Michael, to United Glass Limited; and Universal Wines & Spirits Limited. Bottle. 287,936, 1-27-87, Cl. D9-372.000.
Mizuma, Kensuke: *See*—
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,924, Cl. D7-351.000.
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,925, Cl. D7-351.000.
Motorola Computer Systems, Inc.: *See*—
Ng, Edward C.; and Casnovsky, William M., 287,968, Cl. D14-106.000.
Nakazawa, Hiroshi; and Koida, Kazushi, to Seibido Co. Ltd. Combined camera and film cassette therefor. 287,976, 1-27-87, Cl. D16-1.000.
NEC Corporation: *See*—
Oyamada, Takashi, 287,905, Cl. D3-106.000.
Ng, Edward C.; and Casnovsky, William M., to Motorola Computer Systems, Inc. Computer workstation. 287,968, 1-27-87, Cl. D14-106.000.
Nicolos, Charlie O.: *See*—
Brechtbill, George V.; and Nicolos, Charlie O., 287,962, Cl. D12-345.000.
Nishio, Hideaki; and Matsuda, Kazuo, to Bridgestone Corporation. Motorcycle tire. 287,956, 1-27-87, Cl. D12-147.000.
Nishio, Hideaki: *See*—
Hayakawa, Toshio; Tomura, Atsushi; and Nishio, Hideaki, 287,957, Cl. D12-147.000.
Tomura, Atsushi; and Nishio, Hideaki, 287,954, Cl. D12-147.000.
North American Philips Corporation: *See*—
Tsuji, Masao; and Rakocy, William J., 287,906, Cl. D3-30.500.
O'Connor, David F.: *See*—
Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., 287,974, Cl. D14-114.000.
Olson, Steven L.: *See*—
Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., 288,005, Cl. D24-61.000.
Oyamada, Takashi, to NEC Corporation. Holder for a pager. 287,905, 1-27-87, Cl. D3-106.000.
P.T.C., Inc.: *See*—
Lummis, Michael G., 287,991, Cl. D22-129.000.
Pape, John A.: *See*—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,984, Cl. D21-122.000.
Pau, Hyo-Sup. Wheel balancing machine. 287,945, 1-27-87, Cl. D10-82.000.
Parker, Robert M.: *See*—
Gebhard, Albert W.; Au, William G.; and Parker, Robert M., 288,019, Cl. D32-37.000.
Partecipazioni Bulgari S.p.A.: *See*—
Bulgari, Gianni, 287,949, Cl. D11-6.000.
Peart, Stephen: *See*—
Gemmell, Rob J.; Esslinger, Hartmut H.; and Peart, Stephen, 287,967, Cl. D14-100.000.
Perkins, George, to TeleQuest, Inc. Housing for a telephone handset and stand unit. 287,964, 1-27-87, Cl. D14-53.000.
Perkins, Nancy J., to Sears, Roebuck and Co. Hand vacuum nozzle and housing. 288,014, 1-27-87, Cl. D32-18.000.
Persson, Lars-Olov: *See*—
Hagg, Jan O.; and Persson, Lars-Olov, 287,929, Cl. D8-51.000.
Pfister, Murray C., to Boyd Lighting Company. Bracket for a wall lamp or similar article. 288,009, 1-27-87, Cl. D26-145.000.
Picozza, Augusto A., to Dart Industries Inc. Flexible band for holding game pieces or the like. 287,983, 1-27-87, Cl. D21-48.000.
Pierce, Alfred R., Jr. Athletic glove. 287,904, 1-27-87, Cl. D29-22.000.
Piercy, Michael: *See*—
Mills, Frederick G. W.; and Piercy, Michael, 287,933, Cl. D9-349.000.
Mills, Frederick G. W.; and Piercy, Michael, 287,936, Cl. D9-372.000.
Plastics, Inc.: *See*—
Pomroy, James F.; Danley, Allen M.; and Rubbright, Harry A., 287,917, Cl. D7-18.000.
Polly, Marc: *See*—
Verdier, Alain; and Polly, Marc, 288,015, Cl. D32-18.000.
Pomroy, James F.; Danley, Allen M.; and Rubbright, Harry A., to Plastics, Inc. Microwave oven covered dish. 287,917, 1-27-87, Cl. D7-18.000.
Pope, Kevin C.: *See*—
Seward, Barry; Woolman, Paul; Pope, Kevin C.; Redshaw, Digby R.; Hastings, Malcolm B.; and Withall, Malcolm D. N., 287,932, Cl. D9-305.000.
Porta Systems Corp.: *See*—
Fasano, Michael; and De Luca, Paul, 287,963, Cl. D13-24.000.
Pressmaster Tool AB: *See*—
Hagg, Jan O.; and Persson, Lars-Olov, 287,929, Cl. D8-51.000.
Prinzhorn, Ernest F. J. Automated teller service center enclosure. 288,011, 1-27-87, Cl. D99-28.000.
Quaker Oats Company, The: *See*—
Klamer, Reuben B., 287,990, Cl. D21-226.000.
Raffo, David M.: *See*—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,984, Cl. D21-122.000.
Rakocy, William J.: *See*—
Tsuji, Masao; and Rakocy, William J., 287,906, Cl. D3-30.500.
Redshaw, Digby R.: *See*—
Seward, Barry; Woolman, Paul; Pope, Kevin C.; Redshaw, Digby R.; Hastings, Malcolm B.; and Withall, Malcolm D. N., 287,932, Cl. D9-305.000.
Regina Co., Inc., The: *See*—
Watkins, Donald E.; and Aadahl, Frank P., 288,016, Cl. D32-22.000.
Richards, Fernando C. Clock. 287,941, 1-27-87, Cl. D10-7.000.
Rosenthal Aktiengesellschaft Rechtsabteilung: *See*—
Wirkkala, Tapio, 287,923, Cl. D7-321.000.
Rubbright, Harry A.: *See*—
Pomroy, James F.; Danley, Allen M.; and Rubbright, Harry A., 287,917, Cl. D7-18.000.
Rung, Robert: *See*—
McLennan, William R.; and Rung, Robert, 287,992, Cl. D23-7.000.
Sachs, Isaac. Retention washer. 287,938, 1-27-87, Cl. D9-439.000.

Safe Flight Instrument Corporation: *See*—
Greene, Leonard M., 287,961, Cl. D12-300.000.
Sargent, Charles L.; Larime, Michael W.; and Selina, John R., to Thetford Corporation. Bottle. 287,937, 1-27-87, Cl. D9-375.000.
Schlarb, Glenn. Combined swing and plural shelf unit. 287,910, 1-27-87, Cl. D6-347.000.
Schroeck, Joseph P.: *See*—
Hicks, Irwin A.; and Schroeck, Joseph P., 287,947, Cl. D10-102.000.
Schueler, Georgiana. Bird feeder. 288,013, 1-27-87, Cl. D30-13.000.
Sears, Roebuck and Co.: *See*—
Perkins, Nancy J., 288,014, Cl. D32-18.000.
Seibido Co. Ltd.: *See*—
Nakazawa, Hiroshi; and Koida, Kazushi, 287,976, Cl. D16-1.000.
Selina, John R.: *See*—
Sargent, Charles L.; Larime, Michael W.; and Selina, John R., 287,937, Cl. D9-375.000.
Seward, Barry; Woolman, Paul; Pope, Kevin C.; Redshaw, Digby R.; Hastings, Malcolm B.; and Withall, Malcolm D. N. Packaging container for beverages. 287,932, 1-27-87, Cl. D9-305.000.
Sherman & Gray: *See*—
Sherman, Sam S., 287,900, Cl. D2-247.000.
Sherman, Sam S., to Sherman & Gray. Protective cap. 287,900, 1-27-87, Cl. D2-247.000.
Singer Company, The: *See*—
Hicks, Irwin A.; and Schroeck, Joseph P., 287,947, Cl. D10-102.000.
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Clements, Jack D., 287,919, Cl. D7-40.000.
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Forsyth, James A., 287,902, Cl. D2-318.000.
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Woolf, Peter, 287,914, Cl. D6-419.000.
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Matsui, Tomotoshi, 287,986, Cl. D21-150.000.
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Watanabe, Kiyoshi, 287,928, Cl. D8-22.000.
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Takahashi, Kunio, 288,000, Cl. D23-121.000.
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Mills, Frederick G. W.; and Piercy, Michael, 287,933, Cl. D9-349.000.
Mills, Frederick G. W.; and Piercy, Michael, 287,936, Cl. D9-372.000.
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Mills, Frederick G. W.; and Piercy, Michael, 287,933, Cl. D9-349.000.
Mills, Frederick G. W.; and Piercy, Michael, 287,936, Cl. D9-372.000.
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Victaulic Company of America: *See*—
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Woolf, Peter, to Spartan International Corporation. Foldable book support. 287,914, 1-27-87, Cl. D6-419.000.
Woolman, Paul: *See*—
Seward, Barry; Woolman, Paul; Pope, Kevin C.; Redshaw, Digby R.; Hastings, Malcolm B.; and Withall, Malcolm D. N., 287,932, Cl. D9-305.000.
Worthy Industrial Inc.: *See*—
Yu, Jackson, 287,907, Cl. D3-35.000.
Wyss, B. O.: *See*—
Laughlin, Jennifer, 287,901, Cl. D2-252.000.
Wyss, E. L.: *See*—
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Yerkes, Richard H. Bicycle seat post with spring support. 287,951, 1-27-87, Cl. D12-119.000.
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ISSUED JANUARY 27, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2.1 R 4,638,509
6 4,638,510
161 A 4,638,511
171 4,638,512
268 4,638,513

CLASS 4

239 4,638,514
661 4,638,515

CLASS 5

64 4,638,516
236 R 4,638,517
452 4,638,518
455 4,638,519

CLASS 15

22 R 4,638,520
98 4,638,523
111 4,638,521
160 4,638,522
249 4,638,524
250.36 4,638,525
367 4,638,526
371 4,638,527

CLASS 16

82 4,638,528
111 R 4,638,529

CLASS 24

3 L 4,638,530
274 R 4,638,531
462 4,638,532
633 4,638,533
683 4,638,534

CLASS 29

1.3 4,638,535
25.35 4,638,536
40 4,638,537
149.5 C 4,638,538
157 R 4,638,539
168 4,638,540
402.06 4,638,541
408 4,638,542
426.5 4,638,543
434 4,638,544
460 4,638,545
526 R 4,638,546
558 4,638,547
4,638,548
564.4 4,638,549
568 4,638,550
571 4,638,551
576 J 4,638,552
580 4,638,553
605 4,638,554
623.1 4,638,555
723 4,638,556
766 4,638,557
861 4,638,558
874 4,638,559

CLASS 30

47 4,638,560
284 4,638,561
296 R 4,638,562

CLASS 33

169 R 4,638,563
185 R 4,638,564
265 4,638,565
534 4,638,566
540 4,638,567
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562 4,638,569
4,638,570

CLASS 34

1 4,638,571
41 4,638,572
82 4,638,573

CLASS 36

7.2 4,638,574
38 4,638,575
68 4,638,576
114 4,638,577
119 4,638,578
136 4,638,579

CLASS 40

503 4,638,580

CLASS 42

7 4,638,581
71.01 4,638,582

CLASS 43

4 4,638,583
17.6 4,638,584
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42.13 4,638,586
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88 4,638,589
4,638,590
89 4,638,591
122 4,638,592

CLASS 44

62 4,639,255
71 4,639,256

CLASS 47

1 R 4,638,594
39 4,638,595

CLASS 49

56 4,638,596
340 4,638,597
394 4,638,598

CLASS 51

52 R 4,638,599
164.2 4,638,600
165.71 4,638,601
217 R 4,638,602
219 R 4,638,603

CLASS 52

6 4,638,604
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79.9 4,638,607
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109 4,638,610
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167 4,638,609
173 DS 4,638,612
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238.1 4,638,614
364 4,638,615
397 4,638,616
474 4,638,617
509 4,638,618
729 4,638,619

CLASS 53

382 4,638,620

CLASS 55

16 4,639,257
52 4,639,258
71 4,639,259
302 4,639,260
502 4,639,261

CLASS 56

9 4,638,621
17.4 4,638,622
341 4,638,623

CLASS 57

208 4,638,624
263 4,638,625
401 4,638,626

CLASS 59

80 4,638,627

CLASS 60

39.02 4,638,628
39.65 4,638,629
39.182 4,638,630
226.3 4,638,631
319 4,638,632
518 4,638,633
612 4,638,634
716 4,638,635
718 4,638,637
741 4,638,636

CLASS 62

9 4,638,638
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139 4,638,640
180 4,638,641
209 4,638,643
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478 4,638,646
498 4,638,642

CLASS 65

158 4,639,263

CLASS 66

84 A 4,638,647
193 4,638,648

CLASS 70

71 4,638,649
179 4,638,650
364 A 4,638,651
454 4,638,652

CLASS 71

87 4,639,264
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92 4,639,266
98 4,639,267
105 4,639,268

CLASS 72

129 4,638,653
201 4,638,654
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CLASS 73

4 R 4,638,656
78 4,638,657
117.3 4,638,658
119 A 4,638,659
178 R 4,638,660
237 4,638,661
302 4,638,662
313 4,638,663
384 4,638,664
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432.1 4,638,667
517 R 4,638,669
658 4,638,670
708 4,638,671
861.52 4,638,672
862.17 4,638,673
863.12 4,638,674
864.34 4,638,675
866.5 4,638,668

CLASS 74

31 4,638,676
84 R 4,638,677
476 4,638,678
501 R 4,638,679
516 4,638,680
544 4,638,681
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594.6 4,638,685
688 4,638,686
691 4,638,687
763 4,638,688
866 4,638,689
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4,638,691

CLASS 75

76 4,639,269

CLASS 81

9.41 4,638,692

CLASS 82

2.5 4,638,693
18 4,638,694

CLASS 83

100 4,638,695
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467 R 4,638,700
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628 4,638,704
701 4,638,705

CLASS 84

1.01 4,638,706
1.19 4,638,707
4,638,709
1.26 4,638,710
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313 4,638,711

CLASS 89

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41.12 4,638,715
199 4,638,716

CLASS 91

26 4,638,717
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373 4,638,719
522 4,638,720

CLASS 92

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237 4,638,725
241 4,638,726

CLASS 98

2.08 4,638,728
79 4,638,727

CLASS 99

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CLASS 100

229 A 4,638,730
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CLASS 101

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CLASS 102

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CLASS 104

172.2 4,638,740

CLASS 105

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CLASS 106

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281 N 4,639,273

CLASS 108

56.1 4,638,744
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CLASS 109

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CLASS 110

264 4,638,747

CLASS 111

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CLASS 112

121.12 4,638,749
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CLASS 114

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91 4,638,755

CLASS 118

215 4,638,756
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658 4,638,760
694 4,638,761
725 4,638,762

CLASS 119

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CLASS 122

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CLASS 123

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CLASS 126

24 4,638,786
25 R 4,638,787
198 4,638,788
351 4,638,789

CLASS 128

1 A 4,638,791
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88 Re.32,335
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CLASS 131

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CLASS 134

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CLASS 135

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CLASS 137

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627.5 4,638,837

CLASS 138

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CLASS 139

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CLASS 141

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302 4,638,842

CLASS 144

350 4,638,843

CLASS 148

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33.3 4,639,277
108 4,639,278
147 4,639,279
404 4,639,280
407 4,639,281

CLASS 156

53 4,639,282
89 4,639,283
213 4,639,284
272.6 4,639,285
307.3 4,639,286
361 4,639,287
643 4,639,288
4,639,289
644 4,639,290

CLASS 160

23 R 4,638,844

CLASS 162

207 4,639,291
375 4,639,292

CLASS 164

12 4,638,845
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311 4,638,849

CLASS 165

26 4,638,850
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47 4,638,852
50 4,638,853
76 4,638,854
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162 4,638,857
185 4,638,858

CLASS 166

51 4,638,859
114 4,638,860
247 4,638,861
248 4,638,862
4,638,863
250 Re.32,336
251 4,638,864
274 4,638,865

CLASS 169

90 4,638,866

CLASS 172

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762 4,638,868
821 4,638,869

CLASS 173

12 4,638,870

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CLASS 174

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36 4,639,545
92 4,639,546

CLASS 175

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CLASS 177

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CLASS 178

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22.17 4,639,548

CLASS 180

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324 4,638,883

CLASS 181

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CLASS 182

151 4,638,885

CLASS 187

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9 R 4,638,887
19 4,638,888
29 R 4,638,889

CLASS 188

24.17 4,638,890
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59 4,638,892
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170 4,638,894
280 4,638,895
299 4,638,896

CLASS 192

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3.3 4,638,897
81 C 4,638,899
85 CA 4,638,900

CLASS 198

323 4,638,901
345 4,638,902
419 4,638,903
463.6 Re.32,337
468.2 4,638,904
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803.9 4,638,906

CLASS 200

1 V 4,639,558
5 A 4,639,559
19 R 4,639,560
33 R 4,639,561
43.08 4,639,562
50 B Re.32,340
61.45 M 4,639,563
144 R 4,639,564
148 A 4,639,565
158 4,639,566

CLASS 202

205 4,639,293

CLASS 203

88 4,639,294

CLASS 204

38.1 4,639,295
59 F 4,639,297
59 R 4,639,296
4,639,298
181.7 4,639,299
182.3 4,639,300
192.31 4,639,301
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4,639,303
413 4,639,304
426 4,639,305
432 4,639,306

CLASS 206

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632 4,638,913

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412 4,639,310

CLASS 209

143 4,639,311
170 4,639,313
617 4,638,914

CLASS 210

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416.1 4,639,316
433.2 4,639,317
491 4,639,318
651 4,639,319
739 4,639,320

CLASS 211

13 4,638,915

CLASS 215

235 4,638,916
252 4,638,917
295 4,638,918

CLASS 219

10.43 4,639,567
69 M 4,639,568
109 4,639,569
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121 LG 4,639,572
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124.22 4,639,573
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146.23 4,639,576
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541 4,639,580

CLASS 220

288 4,638,919
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CLASS 221

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CLASS 222

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CLASS 223

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111 4,638,932

CLASS 224

41 4,638,933

CLASS 225

97 4,638,934

CLASS 226

171 4,638,935
191 4,638,936

CLASS 228

5.5 4,638,937
180.1 4,638,938
186 4,638,939

CLASS 229

92.3 4,638,940
104 4,638,941

CLASS 235

101 4,639,581
379 4,639,582
380 4,639,583
449 4,639,584
492 4,639,585

CLASS 236

10 4,638,942

CLASS 237

7 4,638,943
8 R 4,638,944

CLASS 239

143 4,638,945
265.33 4,638,946
265.43 4,638,947
307 4,638,949
551 4,638,950
707 4,638,951
722 4,638,948

CLASS 241

3 4,638,952
39 4,638,953
74 4,638,954

CLASS 242

18 PW 4,638,955
35.5 A 4,638,956
58.6 4,638,957
84.1 R 4,638,958
107.4 R 4,638,959

CLASS 244

134 D 4,638,960
142 4,638,961
203 4,638,962

CLASS 248

56 4,638,963
4,638,964
59 4,638,965
62 4,638,966
97 4,638,967
4,638,968
122 4,638,969
342 4,638,970
678 4,638,971

CLASS 250

201 4,639,586
4,639,587
4,639,588
203 R 4,639,589
213 VT 4,639,590
221 4,639,591
223 B 4,639,592
227 4,639,593
4,639,594
231 SE 4,639,595
259 4,639,596
305 4,639,597
339 4,639,598
363 S 4,639,599
4,639,600
385 4,639,601
396 R 4,639,602
504 R 4,639,603
548 4,639,604
554 4,639,605
555 4,639,606
561 4,639,607
578 4,639,608

CLASS 251

1.3 4,638,972
129.02 4,638,973
129.15 4,638,974
149.6 4,638,975
173 4,638,976
248 4,638,977

CLASS 252

8.554 4,639,322
8.8 4,639,321
32.5 4,639,323
48.6 4,639,324
89.1 4,639,325
91 4,639,326
143 4,639,327
299.61 4,639,328
501.1 4,639,329
522 R 4,639,330
609 4,639,331

CLASS 254

228 4,638,978

CLASS 256

13.1 4,638,979

CLASS 260

397.5 4,639,336
408 4,639,337
502.5 C 4,639,338
513.6 4,639,339

CLASS 261

36.1 4,639,340

CLASS 264

40.1 4,639,341
4,639,342
45.5 4,639,343
83 4,639,344
226 4,639,345
280 4,639,346
291 4,639,347

CLASS 266

44 4,638,980

CLASS 267

8 R 4,638,981
131 4,638,982
140.1 4,638,983

CLASS 269

43 4,638,984
244 4,638,985

CLASS 271

98 4,638,986
111 4,638,987
171 4,638,988
227 4,638,989
272 4,638,990
4,638,991
293 4,638,992
315 4,638,993

CLASS 272

122 4,638,994
144 4,638,995
146 4,638,996

CLASS 273

1 GD 4,638,997
29 BB 4,638,998
258 4,638,999

CLASS 277

41 4,639,000

CLASS 279

121 4,639,001

CLASS 280

5.2 4,639,002
5.24 4,639,003
5.32 4,639,004
43.14 4,639,005
96.1 4,639,006
234 4,639,007
405 R 4,639,008
602 4,639,009
615 4,639,010
628 4,639,011
642 4,639,012
707 4,639,013
4,639,014
4,639,015
789

CLASS 285

15 4,639,016
38 4,639,017
184 4,639,018
332 4,639,019
367 4,639,020

CLASS 292

7 4,639,021
150 4,639,022
262 4,639,023
264 4,639,024
337 4,639,025
352 4,639,026

CLASS 293

128 4,639,027

CLASS 294

16 Re.32,338
34 4,639,028
57 4,639,029
64.1 4,639,030

CLASS 296

24 R 4,639,031
62 4,639,032
100 4,639,033
4,639,034
218 4,639,035

CLASS 297

184 4,639,036
334 4,639,037
341 4,639,038
353 4,639,039
379 4,639,040
391 4,639,041
444 4,639,042

CLASS 298

5 4,639,043

CLASS 301

9 DN 4,639,044
37 S 4,639,045
63 PW 4,639,046

CLASS 303

15 4,639,047
22 R 4,639,048

CLASS 307

10 R 4,639,609
83 4,639,610
117 4,639,611
132 E 4,639,612
241 4,639,613
243 4,639,614
269 4,639,615
270 4,639,616
296 R 4,639,617
351 4,639,618
352 4,639,619
446 4,639,620
450 4,639,621
482 4,639,622
492 4,639,623

CLASS 310

154 4,639,624
4,639,625
155 4,639,626
156 4,639,627
194 4,639,628
248 4,639,629
328 4,639,630
344 4,639,631
351 4,639,632

CLASS 312

195 4,639,049
273 4,639,050
275 4,639,051
333 4,639,052

CLASS 313

35 4,639,634
62 4,639,634
123 4,639,635
408 4,639,636
489 4,639,637
534 4,639,638
639 4,639,639

CLASS 315

3 4,639,640
5.41 4,639,641
39 4,639,642
291 Re.32,341
344 4,639,643
382 4,639,644

CLASS 318

51 4,639,645
139 4,639,646
247 4,639,647
254 4,639,648
314 4,639,649
333 4,639,650
432 4,639,651
568 4,639,652
599 4,639,653

CLASS 320

2 4,639,654
14 4,639,655
22 4,639,656

CLASS 322

59 4,639,657

CLASS 323

204 4,639,658
224 4,639,659
231 4,639,551
266 4,639,660
317 4,639,661
343 4,639,662
356 4,639,663

CLASS 324

73 AT 4,639,664
117 H 4,639,665
202 4,639,666
208 4,639,667
4,639,668
239 4,639,669
260 4,639,670
309 4,639,671
318 4,639,672
319 4,639,673
326 4,639,674
334 4,639,675
380 4,639,676
425 4,639,677
457 4,639,678

CLASS 328

20 4,639,679
134 4,639,680
164 4,639,681

CLASS 329

50 4,639,682

CLASS 330

253 4,639,683
259 4,639,684
263 4,639,685
307 4,639,686

CLASS 331

1 A 4,639,687
10 4,639,688
65 4,639,689
96 4,639,690
99 4,639,691
111 4,639,692

CLASS 333

1 4,639,693
128 4,639,694
133 4,639,695
138 4,639,696
155 4,639,697
187 4,639,698
202 4,639,699

CLASS 335

6 4,639,700
21 4,639,701
153 4,639,702
213 4,639,703
255 4,639,704

CLASS 336

5 4,639,705
170 4,639,706
185 4,639,707
200 4,639,708

CLASS 337

360 4,639,709

CLASS 338

108 4,639,710
114 4,639,711
238 4,639,712

CLASS 339

14 R 4,639,053
4,639,054
16 R 4,639,055
17 CF 4,639,058
17 F 4,639,057
4,639,059
17 LC 4,639,056
30 4,639,060
59 M 4,639,061
4,639,062
75 M 4,639,063
89 M 4,639,064
119 R 4,639,065
132 B 4,639,066
143 R 4,639,067
177 R 4,639,068

CLASS 340

63 4,639,713
310 R 4,639,714
347 AD 4,639,715
365 S 4,639,554
571 4,639,716
578 4,639,717
603 4,639,718
652 4,639,719
712 4,639,720
747 4,639,721
784 4,639,722
799 4,639,723
815.01 4,639,724
815.02 4,639,725
825.44 4,639,726
825.57 4,639,727
870.03 4,639,728
870.13 4,639,729
970 4,639,730

CLASS 342

147 4,639,731
371 4,639,732
424 4,639,733

CLASS 343

912 4,639,734

CLASS 346

1.1 4,639,735
75 4,639,736
4,639,737
4,639,738
76 L 4,639,740
76 PH 4,639,739
4,639,741
4,639,742
4,639,743
4,639,744
135.1 4,639,745
140 R 4,639,746
4,639,747
4,639,748
153.1 4,639,749
221 4,639,750
227 4,639,751

CLASS 350

1.7 4,639,069
3.71 4,639,070
4,639,071
6.8 4,639,072
4,639,073
96.15 4,639,074
96.16 4,639,075
96.20 4,639,076
4,639,077
96.21 4,639,078
96.33 4,639,079
96.34 4,639,080
144 4,639,081
172 4,639,082
255 4,639,083
4,639,084
283 4,639,085

322 4,639,086
332 4,639,087
339 F 4,639,088
341 4,639,089
346 4,639,090
347 V 4,639,091
372 4,639,092
388 4,639,093
413 4,639,094
427 4,639,095
4,639,096
507 4,639,097
514 4,639,098
538 4,639,099
611 4,639,100
616 4,639,101
626 4,639,102
636 4,639,103

CLASS 351

117 4,639,104
162 4,639,105

CLASS 353

13 4,639,106

CLASS 354

77 4,639,107
289.1 4,639,108
295 4,639,109
403 4,639,110
455 4,639,112
472 4,639,113
481 4,639,111

CLASS 355

3 DD 4,639,115
4,639,116
4,639,119
3 SH 4,639,126
14 R 4,639,117
4,639,120
4,639,121
15 4,639,122
4,639,123
4,639,124
23 4,639,125
29 4,639,118
35 4,639,127
35 H 4,639,114
75 4,639,128

CLASS 356

5 4,639,129
73.1 4,639,130
4,639,131
124.5 4,639,132
125 4,639,133
223 4,639,134
246 4,639,135
312 4,639,136
339 4,639,137
350 4,639,138
359 4,639,139
372 4,639,142
376 4,639,140
387 4,639,141

CLASS 357

16 4,639,752
22 4,639,753
23.4 4,639,754
23.8 4,639,762
28 4,639,755
30 4,639,756
36 4,639,757
42 4,639,758
74 4,639,759
75 4,639,760
234 4,639,761

CLASS 358

11 4,639,763
14 4,639,764
19 4,639,765
21 R 4,639,766
4,639,767
22 4,639,768
27 4,639,769
76 4,639,770
80 4,639,771
98 4,639,772
105 4,639,773
4,639,774
106 4,639,775
107 4,639,776
120 4,639,777
135 4,639,778
142 4,639,779
150 4,639,780
163 4,639,781
166 4,639,782
4,639,783
167 4,639,784
184 4,639,785
197 4,639,786
214 4,639,787
233 4,639,788
285 4,639,789
293 4,639,790
300 4,639,791
335 4,639,792

CLASS 360

44 4,639,793
46 4,639,794
62 4,639,795
71 4,639,797
72.2 Re.32,342
73 4,639,798
77 4,639,796
85 4,639,799
90 4,639,800
96.5 4,639,801
98 4,639,802
103 4,639,803
105 4,639,804
108 4,639,805
113 4,639,806
4,639,807
121 4,639,808
4,639,809
125 4,639,810
4,639,811
126 4,639,812
128 4,639,813
130.1 4,639,814
131 4,639,815
4,639,816

CLASS 361

62 4,639,817
106 4,639,818
115 4,639,819
124 4,639,820
151 4,639,821
155 4,639,822
159 4,639,823
179 4,639,824
212 4,639,825
272 4,639,826
4,639,827
4,639,828
286 4,639,831
306 4,639,832
315 4,639,833
386 4,639,829
388 4,639,834
392 4,639,835
411 4,639,830
433 4,639,836

CLASS 362

32 4,639,837
33 4,639,838
64 4,639,839
80 4,639,840
227 4,639,841
376 4,639,842
431 4,639,843

CLASS 363

17 4,639,844
26 4,639,845
39 4,639,846
46 4,639,847
51 4,639,848
56 4,639,849
58 4,639,850
164 4,639,851

CLASS 364

4,639,852
4,639,853
4,639,854
4,639,855
200 4,639,856
4,639,857
4,639,858
4,639,859
4,639,860
4,639,861
4,639,862
4,639,863
4,639,864
4,639,865
4,639,866
414 4,639,867
420 4,639,868
424.1 4,639,869
431.05 4,639,870
431.10 4,639,871
463 4,639,872
466 4,639,873
478 4,639,874
479 4,639,875
483 4,639,876
513 4,639,878
513.5 4,639,877
518 4,639,879
519 4,639,880
521 4,639,881
550 4,639,882
557 4,639,883
565 4,639,884
574 4,639,885
736 4,639,886
748 4,639,887
788 4,639,888
900 4,639,889
4,639,890
4,639,891

CLASS 368

182 4,639,892
185 4,639,893
189 4,639,894
200 4,639,895
4,639,896
4,639,897
202 4,639,898
230 4,639,899

CLASS 366

89 4,639,143

CLASS 367

5 4,639,900
13 4,639,901
93 4,639,902
131 4,639,903
140 4,639,904
189 4,639,905

CLASS 368

276 4,639,144

CLASS 369

14 4,639,906
45 4,639,907
288 4,639,908

CLASS 370

58 4,639,909
4,639,910
69.1 4,639,911
86 4,639,912
90 4,639,913
110.1 4,639,914

CLASS 371

10 4,639,915
16 4,639,916
4,639,917
20 4,639,918
27 4,639,919
31 4,639,920
53 4,639,921

CLASS 372

19 4,639,922
21 4,639,923
33 4,639,924
46 4,639,925
87 4,639,926

CLASS 373

84 4,639,927
93 4,639,928
120 4,639,929
4,639,930
138 4,639,931

CLASS 375

1 4,639,932
8 4,639,933
10 4,639,934
11 4,639,935
36 4,639,936
40 4,639,937
60 4,639,938
118 4,639,939

CLASS 376

107 4,639,348
254 4,639,349
290 4,639,350
310 4,639,351

CLASS 377

60 4,639,940

CLASS 378

11 4,639,941
96 4,639,943
045 4,639,942

CLASS 379

29 4,639,557
62 4,639,549
4,639,550
199 4,639,552
327 4,639,555
377 4,639,553

CLASS 381

68.6 4,639,556

CLASS 384

19 4,639,145
99 4,639,146
125 4,639,147
420 4,639,148
477 4,639,149
536 4,639,150

CLASS 400

63 4,639,151
120 4,639,152
202.1 4,639,153
584 4,639,154

CLASS 401

1 4,639,155
146 4,639,156

CLASS 402

19 4,639,157

CLASS 403

31 4,639,158
50 4,639,159
71 4,639,160
245 4,639,161
316 4,639,162
322 4,639,163

CLASS 405

45 4,639,165
54 4,639,164
203 4,639,166
217 4,639,167
239 4,639,168
291 4,639,169

CLASS 408

76 4,639,170
89 4,639,171

CLASS 409

80 4,639,172
122 4,639,173

CLASS 411

34 4,639,174
38 4,639,175
468 4,639,176

CLASS 412

11 4,639,177

CLASS 413

26 4,639,178

CLASS 414

223 4,639,179
224 4,639,180
349 4,639,181
543 4,639,182
705 4,639,183
730 4,639,184
733 4,639,185
734 4,639,186
787 4,639,187

CLASS 415

9 4,639,188
115 4,639,189
129 4,639,190
196 4,639,191

CLASS 416

27 4,639,192
184 4,639,193
190 Re.32,339
241 B 4,639,194

CLASS 417

216 4,639,195
228 4,639,196
259 4,639,197
410 4,639,198

CLASS 418

3 4,639,199
48 4,639,200
55 4,639,201
59 4,639,202
61 B 4,639,203

CLASS 419

15 4,639,352

CLASS 422

46 4,639,353
140 4,639,354

CLASS 423

112 4,639,355
266 4,639,356
306 4,639,357
4,639,358
321 R 4,639,359
329 4,639,360
347 4,639,361
554 4,639,362
644 4,639,363

CLASS 424

9 4,639,364
4,639,365
19 4,639,366
45 4,639,367
48 4,639,368
59 4,639,369
80 4,639,370
86 4,639,371
88 4,639,372
101 4,639,373

CLASS 425

3 4,639,204
200 4,639,205
503 4,639,206
4,639,207

CLASS 426

43 4,639,374
49 4,639,375
134 4,639,376

CLASS 427

10 4,639,377
35 4,639,378
40 4,639,379
97 4,639,380
156 4,639,381
162 4,639,382
213 4,639,383
290 4,639,384
386 4,639,385

CLASS 428

35 4,639,386
113 4,639,387
117 4,639,388
141 4,639,389
195 4,639,390
210 4,639,391
283 4,639,392
304.4 4,639,393
327 4,639,394
341 4,639,395
373 4,639,396
397 4,639,397
451 4,639,398
623 4,639,399
694 4,639,400

CLASS 429

30 4,639,401

CLASS 430

58 4,639,402
115 4,639,403
4,639,404
124 4,639,405
165 4,639,406
203 4,639,407
351 4,639,408
505 4,639,409
506 4,639,410
510 4,639,411
523 4,639,412
546 4,639,413
550 4,639,414
558 4,639,415
567 4,639,416
4,639,417
617 4,639,418

CLASS 431

1 4,639,208
4 4,639,209
13 4,639,210
20 4,639,211
183 4,639,212
326 4,639,213
344 4,639,214
354 4,639,215

CLASS 432

105 4,639,216
107 4,639,217

CLASS 433

8 4,639,218
22 4,639,219
69 4,639,220
139 4,639,221

CLASS 434

20 4,639,222
272 4,639,223
286 4,639,224
308 4,639,225
433 4,639,226

CLASS 435

5 4,639,419
7 4,639,420
34 4,639,421
286 4,639,422
287 4,639,423

CLASS 436

74 4,639,424
518 4,639,425

CLASS 441

1 4,639,227
5 4,639,228
42 4,639,229

CLASS 445

30 4,639,230
31 4,639,231

CLASS 446

220 4,639,232
321 4,639,233
327 4,639,234
389 4,639,235
430 4,639,236

CLASS 464

65 4,639,237

CLASS 474

8 4,639,238
4,639,239
144 4,639,240
902 4,639,241

CLASS 494

37 4,639,242

CLASS 501

96 4,639,426
128 4,639,427

CLASS 502

115 4,639,428
117 4,639,429
120 4,639,430
304 4,639,431
324 4,639,432

CLASS 514

8 4,639,433
11 4,639,434
4,639,435
24 4,639,436
54 4,639,437
129 4,639,438
171 4,639,439
178 4,639,440
195 4,639,441
212 4,639,442
222 4,639,443
4,639,444
4,639,445
4,639,446
4,639,447
226 4,639,448
234 4,639,449
238 4,639,450
247 4,639,451
252 4,639,452
254 4,639,453
259 4,639,454
282 4,639,455
283 4,639,456
290 4,639,457
311 4,639,458
343 4,639,459
369 4,639,460
382 4,639,461
383 4,639,462
395 4,639,463
396 4,639,464
419 4,639,465
456 4,639,466
468 4,639,467
620 4,639,468
729 4,639,469

CLASS 518

700 4,639,470

CLASS 521

172 4,639,471

CLASS 522

107 4,639,472

CLASS 523

141 4,639,474
164 4,639,475
213 4,639,476

CLASS 524

83 4,639,477
97 4,639,478
100 4,639,479
104 4,639,480
128 4,639,481
137 4,639,482
296 4,639,483
318 4,639,484
378 4,639,485
409 4,639,486
425 4,639,487
456 4,639,488
588 4,639,489
765 4,639,490
801 4,639,491

CLASSIFICATION OF PATENTS

CLASS 525

54.42 4,639,492
83 4,639,473
113 4,639,493
271 4,639,494
285 4,639,495
506 4,639,496

CLASS 526

93 4,639,497
196 4,639,498
285 4,639,499
301 4,639,500

CLASS 528

15 4,639,501
45 4,639,502
92 4,639,503
176 4,639,504
211 4,639,505
212 4,639,506
388 4,639,507
486 4,639,508

CLASS 530

303 4,639,332
4,639,333
307 4,639,509
4,639,510
4,639,511
313 4,639,512
387 4,639,513

CLASS 536

30 4,639,514
4,639,515
123 4,639,516

CLASS 540

304 4,639,335

CLASS 544

85 4,639,517
285 4,639,518
320 4,639,519

CLASS 546

45 4,639,520
141 4,639,521
194 4,639,522
209 4,639,523
229 4,639,524
290 4,639,525

CLASS 548

140 4,639,526
262 4,639,527
422 4,639,528
550 4,639,529
952 4,639,334

CLASS 549

260 4,639,530
261 4,639,531
332 4,639,532
411 4,639,533
414 4,639,534
419 4,639,535
462 4,639,536

CLASS 558

48 4,639,537
71 4,639,538
363 4,639,539
444 4,639,540

CLASS 560

20 4,639,541

CLASS 604

6 4,639,243
19 4,639,244
152 4,639,245
158 4,639,246
175 4,639,247
187 4,639,248
198 4,639,249
201 4,639,250
260 4,639,251
282 4,639,252
362 4,639,253
385 R 4,639,254

CLASSIFICATION OF DESIGNS

D2— 247 287,900
252 287,901
318 287,902
321 287,903
D3— 30.5 287,906
35 287,907
106 287,905
D6— 328 287,908
329 287,909
347 287,910
382 287,911
408 287,912
409 287,913
419 287,914
515 287,915
567 287,916
D7— 18 287,917
19 287,918
40 287,919
70 287,920
77 287,921
99 287,922
321 287,923
351 287,924
287,925
368 287,926
D8— 17 287,927
22 287,928
51 287,929
64 287,930
373 287,931
D9— 305 287,932
349 287,933
370 287,934
372 287,935
287,936
375 287,937
439 287,938
447 287,939
D10— 6 287,940
7 287,941
53 287,942
287,943
64 287,944
82 287,945
98 287,946
102 287,947
115 287,948
D11— 6 287,949
143 287,950
D12— 119 287,951
136 287,952
146 287,953
147 287,954
287,955
287,956
287,957
169 287,958
202 287,959
211 287,960
300 287,961
345 287,962
D13— 24 287,963
99 287,965
D14— 4 287,970
53 287,964
287,971
55 287,966
100 287,967
287,972
106 287,968
287,969
111 287,973
114 287,974
D15— 134 287,975
D16— 1 287,976
132 287,977
D18— 7 287,978
24 287,979
D19— 86 287,980
92 287,981
D21— 34 287,982
48 287,983
122 287,984
149 287,985
150 287,986
155 287,987
204 287,988
207 287,989
226 287,990
D22— 129 287,991
D23— 7 287,992
17 287,993
18 287,994
19 287,995
36 287,996
46 287,997
71 287,998
72 287,999
121 288,000
131 288,001
139 288,002
150 288,003
D24— 51 288,004
61 288,005
63 288,006
D26— 51 288,007
139 288,008
145 288,009
D27— 8 288,010
D28— 86 288,012
D29— 22 287,904
D30— 13 288,013
D32— 18 288,014
288,015
22 288,016
25 288,017
35 288,018
37 288,019
D99— 28 288,011

CLASSIFICATION OF PLANTS

P.— 15 5,864
43 5,865
54 5,866
68 5,867
5,868
5,869

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,638,737
4,638,739
4,638,807
4,638,850
4,639,642
02 : 4,638,786
04 : 4,639,005
4,639,007
4,639,017
4,639,024
4,639,028
4,639,103
4,639,139
4,639,226
4,639,313
4,639,680
4,639,760
05 : 4,638,770
4,638,922
06 : Re.32,341
4,638,544
4,638,553
4,638,558
4,638,563
4,638,567
4,638,582
4,638,591
4,638,596
4,638,603
4,638,611
4,638,633
4,638,634
4,638,645
4,638,653
4,638,669
4,638,672
4,638,681
4,638,696
4,638,698
4,638,707
4,638,780
4,638,798
4,638,799
4,638,803
4,638,805
4,638,809
4,638,811
4,638,823
4,638,825
4,638,854
4,638,933
4,638,934
4,638,947
4,638,959
4,638,963
4,639,026
4,639,027
4,639,044
4,639,045
4,639,061
4,639,068
4,639,106
4,639,127
4,639,128
4,639,142
4,639,157
4,639,176
4,639,189
4,639,191
4,639,234
4,639,245
4,639,246
4,639,251
4,639,259
4,639,274
4,639,288
4,639,290
4,639,307
4,639,343
4,639,366
4,639,385
4,639,460
4,639,530
4,639,542
4,639,569
4,639,587
4,639,598
4,639,610
4,639,612
4,639,619
4,639,661
4,639,669
4,639,671
4,639,715
4,639,756
4,639,766
4,639,772
4,639,774
4,639,789
4,639,794
4,639,798
4,639,818
4,639,843
4,639,863
4,639,864
4,639,873
4,639,884
4,639,887
4,639,893
4,639,899
4,639,903
4,639,915
4,639,921
4,639,926
08 : 4,638,513
4,638,764
4,639,054
4,639,126
4,639,293
4,639,653
4,639,684
4,639,685
4,639,808
09 : Re.32,342
4,638,530
4,638,535
4,638,620
4,638,651
4,638,732
4,638,935
4,639,009
4,639,153
4,639,228
4,639,300
4,639,322
4,639,356
4,639,393
4,639,485
4,639,513
4,639,529
4,639,532
4,639,593
4,639,704
4,639,885
4,639,910
4,639,933
10 : 4,638,571
4,638,648
4,638,758
4,639,265
4,639,317
4,639,454
4,639,495
12 : Re.32,339
4,638,512
4,638,547
4,638,595
4,638,621
4,638,800
4,638,810
4,638,824
4,638,841
4,638,968
4,638,996
4,639,000
4,639,138
4,639,173
4,639,223
4,639,262
4,639,359
4,639,455
4,639,539
4,639,658
4,639,710
4,639,720
4,639,788
4,639,896
4,639,934
4,639,937
13 : 4,638,559
4,638,829
4,638,847
4,639,102
4,639,611
4,639,728
4,639,825
17 : Re.32,338
4,638,606
4,638,616
4,638,617
4,638,743
4,638,769
4,638,869
4,638,916
4,638,932
4,638,937
4,638,973
4,638,994
4,639,019
4,639,031
4,639,035
4,639,051
4,639,056
4,639,081
4,639,175
4,639,188
4,639,217
4,639,230
4,639,236
4,639,275
4,639,296
4,639,368
4,639,381
4,639,383
4,639,424
4,639,509
4,639,510
4,639,511
4,639,524
4,639,566
4,639,571
4,639,631
4,639,657
4,639,665
4,639,667
4,639,716
4,639,821
4,639,876
4,639,877
18 : 4,638,614
4,638,792
4,638,942
4,639,034
4,639,279
4,639,391
4,639,433
4,639,486
4,639,646
4,639,763
4,639,780
4,639,783
4,639,784
4,639,785
4,639,786
4,639,840
4,639,842
19 : 4,638,546
4,638,720
4,638,729
4,638,938
4,639,342
4,639,561
4,639,626
20 : 4,638,665
4,639,718
21 : Re.32,335
4,638,740
4,638,806
4,639,504
4,639,578
22 : 4,638,584
4,638,873
4,639,167
4,639,192
4,639,258
24 : 4,639,472
4,638,920
4,638,929
4,639,298
4,639,396
4,639,399
4,639,618
4,639,623
4,639,655
4,639,688
4,639,690
4,639,732
4,639,902
25 : 4,638,576
4,638,636
4,638,656
4,638,749
4,639,075
4,639,109
4,639,301
4,639,348
4,639,373
4,639,481
4,639,501
4,639,543
4,639,562
4,639,637
4,639,644
4,639,683
4,639,697
4,639,736
4,639,792
4,639,860
4,639,874
4,639,891
4,639,936
26 : 4,638,510
4,638,511
4,638,529
4,638,533
4,638,537
4,638,548
4,638,570
4,638,604
4,638,678
4,638,686
4,638,715
4,638,761
4,638,773
4,638,836
4,638,837
4,638,842
4,638,846

4,638,849
4,638,898
4,638,930
4,638,965
4,639,016
4,639,033
4,639,038
4,639,085
4,639,087
4,639,194
4,639,198
4,639,206
4,639,207
4,639,213
4,639,235
4,639,387
4,639,493
4,639,533
4,639,560
4,639,568
4,639,609
4,639,869
4,639,878
27 : 4,638,523
4,638,640
4,638,641
4,638,772
4,638,777
4,638,790
4,638,830
4,638,899
4,638,998
4,639,036
4,639,055
4,639,147
4,639,202
4,639,203
4,639,286
4,639,412
4,639,445
4,639,483
4,639,540
4,639,709
4,639,802
4,639,845
28 : 4,639,675
29 : 4,638,579
4,638,586
4,638,871
4,638,928
4,638,952
4,638,997
4,639,281
4,639,323
4,639,324
4,639,364
4,639,422
4,639,480
4,639,520
30 : 4,639,327
31 : 4,638,565
4,638,867
4,638,888
4,639,841
32 : 4,638,577
33 : 4,638,562
4,638,797
4,639,738

34 : 4,639,858
4,638,514
4,638,536
4,638,551
4,638,601
4,638,615
4,638,652
4,638,662
4,638,762
4,638,804
4,638,808
4,638,814
4,638,826
4,638,889
4,638,940
4,639,020
4,639,029
4,639,116
4,639,218
4,639,231
4,639,242
4,639,250
4,639,253
4,639,330
4,639,369
4,639,372
4,639,420
4,639,431
4,639,443
4,639,446
4,639,461
4,639,466
4,639,487
4,639,518
4,639,583
4,639,584
4,639,614
4,639,615
4,639,638
4,639,695
4,639,752
4,639,773
4,639,781
4,639,859
4,639,883
4,639,897
4,639,898
4,639,914
4,639,922
4,639,931
4,639,932
35 : 4,639,586
36 : 4,638,521
4,638,524
4,638,575
4,638,581
4,638,598
4,638,602
4,638,605
4,638,644
4,638,708
4,638,754
4,638,755
4,638,759
4,638,763
4,638,801
4,638,827

4,638,855
4,638,858
4,638,895
4,638,909
4,638,915
4,638,919
4,638,923
4,638,931
4,638,948
4,638,970
4,638,986
4,639,064
4,639,073
4,639,076
4,639,079
4,639,093
4,639,111
4,639,115
4,639,121
4,639,122
4,639,124
4,639,210
4,639,263
4,639,271
4,639,277
4,639,325
4,639,367
4,639,371
4,639,380
4,639,402
4,639,405
4,639,411
4,639,470
4,639,528
4,639,572
4,639,594
4,639,600
4,639,606
4,639,622
4,639,647
4,639,654
4,639,678
4,639,737
4,639,748
4,639,761
4,639,769
4,639,779
4,639,829
4,639,844
4,639,856
4,639,918
4,639,919
4,639,923
37 : 4,638,619
4,638,787
4,638,820
4,638,875
4,639,032
4,639,196
4,639,261
4,639,316
4,639,421
4,639,459
4,639,536
38 : 4,638,748
39 : 4,638,532
4,638,569

4,638,622
4,638,717
4,638,730
4,638,865
4,638,894
4,638,900
4,638,906
4,638,907
4,638,941
4,638,951
4,638,957
4,638,964
4,638,993
4,639,057
4,639,058
4,639,101
4,639,160
4,639,184
4,639,200
4,639,201
4,639,206
4,639,273
4,639,299
4,639,375
4,639,392
4,639,479
4,639,490
4,639,505
4,639,517
4,639,750
4,639,875
40 : 4,638,859
4,638,971
4,639,233
4,639,255
4,639,308
4,639,552
4,639,557
4,639,719
4,638,587
41 : 4,638,944
4,638,995
4,639,021
4,639,043
42 : 4,638,543
4,638,556
4,638,557
4,638,574
4,638,578
4,638,589
4,638,608
4,638,629
4,638,630
4,638,660
4,638,667
4,638,736
4,638,745
4,638,768
4,638,866
4,638,953
4,638,966
4,638,974
4,639,063
4,639,074
4,639,092
4,639,143
4,639,216

4,639,244
4,639,256
4,639,268
4,639,306
4,639,349
4,639,360
4,639,394
4,639,401
4,639,419
4,639,442
4,639,457
4,639,458
4,639,465
4,639,474
4,639,492
4,639,564
4,639,574
4,639,577
4,639,590
4,639,591
4,639,639
4,639,666
4,639,700
4,639,701
4,639,734
4,639,754
4,639,762
4,639,775
4,639,817
4,639,819
4,639,851
44 : 4,638,564
4,638,721
4,638,999
45 : 4,638,821
4,638,828
4,638,913
4,638,969
4,639,827
4,639,828
4,639,836
47 : 4,638,747
4,638,852
4,639,320
4,639,347
4,639,484
48 : Re.32,336
4,638,516
4,638,519
4,638,541
4,638,588
4,638,593
4,638,597
4,638,628
4,638,676
4,638,712
4,638,726
4,638,796
4,638,833
4,638,834
4,638,860
4,638,862
4,638,863
4,638,864
4,638,872
4,638,910
4,638,924

4,638,972
4,638,978
4,639,015
4,639,078
4,639,105
4,639,133
4,639,164
4,639,247
4,639,312
4,639,314
4,639,365
4,639,388
4,639,428
4,639,555
4,639,596
4,639,664
4,639,677
4,639,714
4,639,724
4,639,729
4,639,890
4,639,901
4,639,905
49 : 4,638,539
4,638,716
4,638,776
4,638,813
4,639,252
4,639,938
51 : 4,638,527
4,638,816
4,638,818
4,638,926
4,639,003
4,639,205
4,639,603
4,639,674
53 : 4,638,566
4,638,592
4,638,692
4,638,711
4,638,791
4,638,884
4,638,885
4,639,012
4,639,156
4,639,249
4,639,730
4,639,824
54 : 4,639,337
4,639,497
4,639,558
4,639,576
55 : Re.32,340
4,638,585
4,638,612
4,638,680
4,638,728
4,638,783
4,638,886
4,638,904
4,638,921
4,639,039
4,639,170
4,639,219
4,639,254
56 : 4,639,154

DESIGN PATENTS

06 : 287,909
287,911
287,927
287,934
287,944
287,945
287,962
287,964
287,967
287,968
287,971
287,985
287,990
287,993

287,995
288,009
288,011
08 : 288,019
09 : 287,906
11 : 287,982
12 : 287,901
287,915
287,972
287,974
288,012
13 : 287,913
287,981
17 : 287,921

287,922
287,950
287,979
288,005
288,014
18 : 287,931
287,975
25 : 287,941
287,965
26 : 287,937
287,958
287,991
27 : 287,917

287,966
28 : 287,980
29 : 287,959
287,996
288,002
34 : 287,904
287,914
288,003
36 : 287,948
287,961
287,963
287,989
288,013

37 : 287,930
39 : 287,902
287,916
287,939
287,994
288,016
40 : 287,910
287,919
287,926
287,987
288,008
288,010
41 : 287,903

288,017
42 : 287,900
287,947
287,951
287,978
287,992
44 : 287,983
48 : 287,920
49 : 287,999
51 : 288,001
55 : 287,940
288,004
288,007

PLANT PATENTS

06 : 5,865

5,866

5,867

39 : 5,868

5,869

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